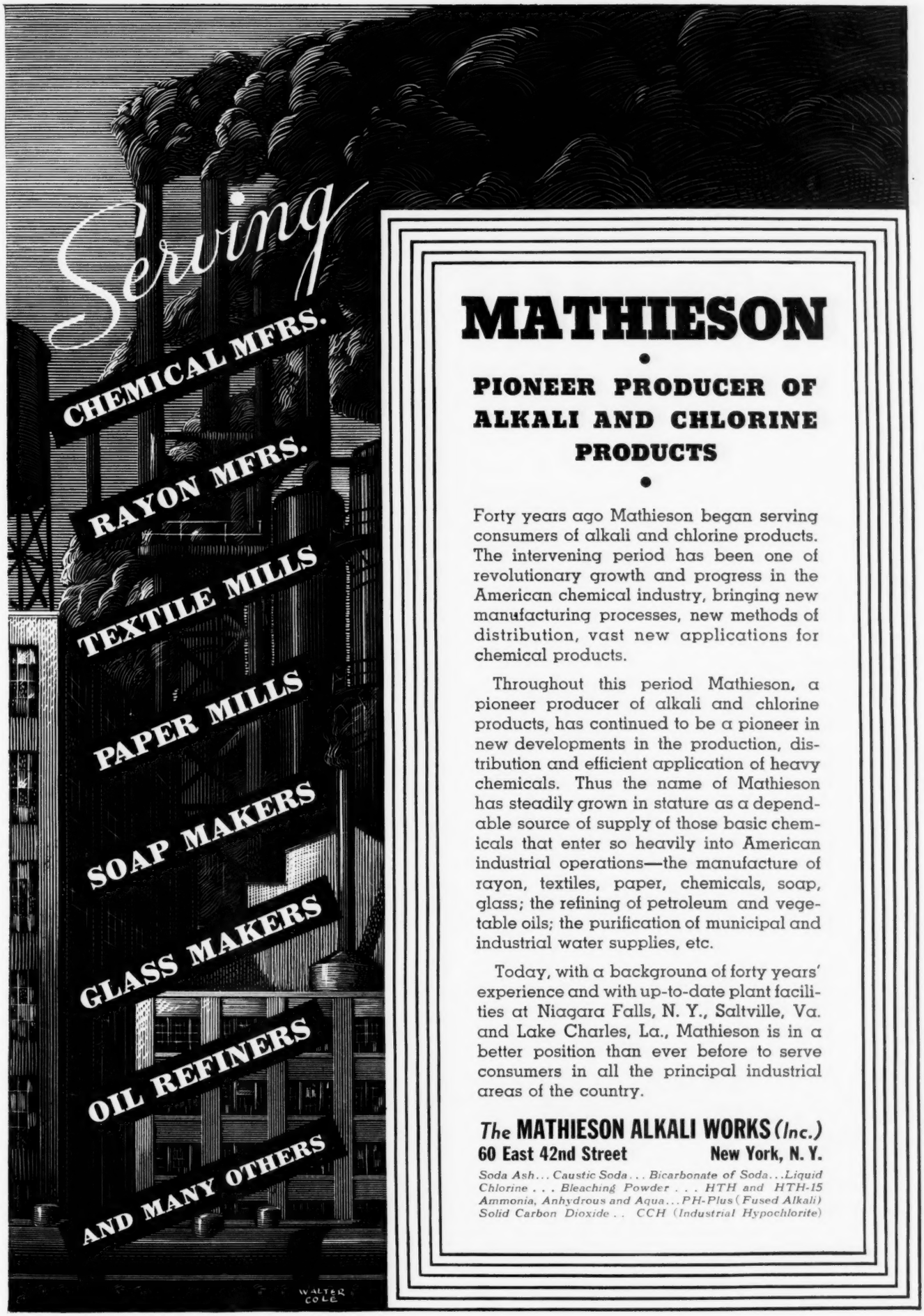


MATHIESON

•

PIONEER PRODUCER OF ALKALI AND CHLORINE PRODUCTS

•

Forty years ago Mathieson began serving consumers of alkali and chlorine products. The intervening period has been one of revolutionary growth and progress in the American chemical industry, bringing new manufacturing processes, new methods of distribution, vast new applications for chemical products.

Throughout this period Mathieson, a pioneer producer of alkali and chlorine products, has continued to be a pioneer in new developments in the production, distribution and efficient application of heavy chemicals. Thus the name of Mathieson has steadily grown in stature as a dependable source of supply of those basic chemicals that enter so heavily into American industrial operations—the manufacture of rayon, textiles, paper, chemicals, soap, glass; the refining of petroleum and vegetable oils; the purification of municipal and industrial water supplies, etc.

Today, with a backgrouna of forty years' experience and with up-to-date plant facilities at Niagara Falls, N. Y., Saltville, Va. and Lake Charles, La., Mathieson is in a better position than ever before to serve consumers in all the principal industrial areas of the country.

The* MATHIESON ALKALI WORKS *(Inc.)
60 East 42nd Street **New York, N. Y.**

Soda Ash... Caustic Soda... Bicarbonate of Soda...Liquid Chlorine . . . Bleaching Powder . . . HTH and HTH-15 Ammonia, Anhydrous and Aqua...PH-Plus (Fused Alkali) Solid Carbon Dioxide . . CCH (Industrial Hypochlorite)

The Reader Writes:—

No Accounting for Tastes

Especially I enjoy your articles on the history of our big concerns; but best of all I like "We—Editorially Speaking," for like *Time's* Miscellany "it brings all things."

Mt. Airy, Pa. ELLWOOD WAGNER.

That "Prestone" Shortage

Referring to your note in the "We" department, my own favorite gas station has quite another and quite as original an explanation for the shortage of "Prestone." According to him it's all due to the fact that perfidious Albion has bought up all the glycerin (out of which "Prestone" is manufactured) and is hoarding it to manufacture airplane fuel for the next war since they have no petroleum in England.

Brooklyn, N. Y. JOHN M. DUNN.

Your garage-man's explanation of his inability to supply "Prestone" is not any more wild than the story current hereabout to the effect that the Standard Oil Co. has cut off the supply of the raw material because they have entered into a secret deal with the du Ponts to boost the sale of their anti-freeze alcohol.

Providence, R. I. J. T. WAINWRIGHT.

Paging John Winthrop, Jr.

On November 23 we wrote the following to John Winthrop, Jr., but up to time of writing we have not been favored with any response:

"Will you please send us immediately the May, 1935 copy of a supplement to CHEMICAL INDUSTRIES published in celebration of the tercentenary of the founding of the American Chemical Industry by John Winthrop, Jr."

Detroit, Mich. FRANKEL COMPANY, INC.

The Dow Consulting Division

In your editorial in the October number, you refer to the Consulting Engineering Division of the Dow Chemical Company, and this Division was also discussed, either directly or indirectly, in the symposium in your November number. In your editorial, in referring to this Division, you state, "It has not been widely publicized nor even clearly defined in its purpose and program." This is entirely true and this letter is merely to clarify this part of the situation rather than to take part in the discussion opened in the pages of your November issue.

In the first place, this organization is a division of the Dow Chemical Company and not a separate corporation. In the second place, it is not proposed that the new Consulting Engineering Division replace the present technical service activities of the Dow Chemical Company and charge users of Dow products for such service. It is very difficult to define just what is meant by "technical service"; but in our own minds, we are convinced that many customers expect, as technical service, activities that are more properly classified as consulting engineering. The Dow Chemical Company still expects to furnish to present and prospective users of its products all possible information regarding these products, their properties, their uses, and even the specific way in which they are used.

On the other hand, in designing the equipment in which these products are to be used, in working up processes in only a step of which a Dow product is used, in studying and improving the performance of plants in which Dow products are used, we feel that a charge should be made to the customer. It is entirely possible, and as a matter of fact has occurred in the past, that a customer who purchased a Dow product in which the gross sale was under $100, expected an amount of engineering service that would have amounted to about $1,000. This, we feel, is not fair to the product nor is it fair to the average customer to load the cost of such service on to the price he pays for the chemical.

This venture is one which is frankly experimental. No one, either in the Dow Chemical Company in general or in this Division in particular, can foresee what the developments will be. Our activities, in general, will probably be divided into the following fields:

1. Technical sales service for The Dow Chemical Company of the type which the customer has a right to expect free.
2. Design of equipment in which Dow products are to be used, where such equipment cannot be purchased and where our own special information is a vital part of the design.
3. Engineering advice in the whole range usually covered by the term "consulting engineering" in any field in which we feel competent to advise, whether a Dow product is involved or not.
4. Development research in new processes and new equipment, either for The Dow Chemical Company, possible users of its products, or other clients whose problems fall within our special field of information.

It should be emphasized that we do not intend to compete with existing consulting organizations. We may take consulting work in which Dow products or Dow problems are not involved, but this will only be because we have special knowledge of the field in question. As a matter of fact, we feel that our venture should be of a distinct benefit to existing consulting engineering concerns. One of their greatest handicaps is the free engineering that is given by manufacturers of both products and equipment in excess of what the customer has a right to expect as reasonable free technical service. If we can establish the precedent that such engineering work should be paid for by the client, we can greatly increase the amount of work available for all consultants; and, while we hope to see this Division stand on its own feet, we shall, nevertheless, be glad if the existence of our Division creates more work for all properly equipped consultants.

Ann Arbor, Mich. W. L. BADGER, Manager,
Consult. Eng. Div., Dow Chemical Co.

Progress and Taxes

Egloff's article is certainly interesting and covers important ground. We are always interested in resins and are on the hunt for low cost petroleum resins.

What are the hopes for synthetic glycerin from cheap sugar, especially corn sugar?

We paint and varnish men feel that the 4.5c per lb. tax on imported oils, particularly those not produced in this country, and which compete with no oil in which we are self-sufficient, is harshly oppressive. Perilla oil is the most hurtful spot.

Brooklyn, N. Y. MICHAEL DONIGER, President,
Empire State Varnish Co., Inc.

CHEMICAL INDUSTRIES

The Chemical Business Magazine

Consulting Editorial Board
R. T. Baldwin, L. W. Bass, F. M. Becket, B. T. Brooks, J. V. N. Dorr, C. R. Downs, W. M. Grosvenor, W. L. Landis, and M. C. Whitaker.

ADVERTISING PAGES REMOVED

Plant and Equipment Are Also Costs

MONSANTO CURRENT EVENTS asks a question which was unknown or ignored by Major Berry when he wrote his so-called "analysis" of wages and production in the chemical industries —"Do you know that Monsanto stockholders have a gross investment of $15,000 in land, buildings, and machinery for each plant operator?"

The report of the President's Coordinator for Industrial Cooperation reaches the broad conclusion that wages have not kept pace with the increased productivity of chemical plant workers. This conclusion, compiled officially and widely distributed as a Government document, is being used to support demands for wage increases and to agitate for union organization.

It is a conclusion based on faulty premises. The figures for "value added by manufacture" are "factory value" minus "cost of materials". His "productivity of labor" is "value added by manufacture" divided by number of workers. Such figures are palpably without real meaning, and if taken at their face value are highly misleading. It is common knowledge that the invested capital in the chemical industry is roughly twice the gross sales, but the question Monsanto asks puts this fact in very plain words.

As a matter of fact, chemical operators, far from being worse off than most industrial workers (as Berry's figures would seem to indicate) are distinctly better off. U. S. Department of Labor figures show that since 1932 chemical workers have suffered less unemployment than in other industries, and have been paid higher hourly rates. Today their weekly wage average is $27 against $23.50 for all industries: their hourly rate, 66½¢ against 57¼¢. This is not the Berry picture.

Williams Haynes, Publisher, A. M. Corbet, Publication Manager; W. J. Murphy, Editorial Manager; W. F. George, Advertising Manager, D. O. Haynes, Subscription Manager; J. H. Burt, Purchaser.

A Matter of Definition The Berry report on chemical wages is not only based on misleading figures, but it uses also a misleading classification of manufacturers, for it includes the makers of ammunition, baking powder, druggist preparations, fertilizers, explosives, paints and varnishes, cosmetics, soap, patent medicines. Only think of the "value added by manufacture" (according to Berry) of a shotgun shell or a stick of shaving soap and just remember the type of workers who mix fertilizers or package cosmetics, then you will see clearly that comparison with the true chemical industry is about as apt as the proverbial cheese with chalk. Thus the matter of definition of "chemical industry," which has long plagued statisticians, comes home to roost on the executive's desk.

We suffer from a sort of chemical class consciousness fostered by professional societies and promoted by our technical journals which have both liberally publicized the so-called "process industries" as a chemical group. True, there are basic economic and technological differences between the fabricating and the processing industries. But we know of no classification that groups dolls, desks, and derricks together as mechanical products. Why should dishes, doilies, and dandruff cures be called chemical products?

Within the group of industries using chemical processes, there are three clearly defined groups. The Chemical Producing Industry, makers of all heavy and fine chemicals, coal-tar intermediates and synthetics, and solvents. This is the chemical industry proper. The Chemical Converting Industries, makers of plastics, rayon, fertilizers, explosives, drugs and cosmetics, paints and varnishes, and all sorts of chemical specialties for industrial, agricultural, and household use. These industries mix and compound chemicals for consumer use. The Chemical Processing Industries which tan leather, bleach and dye textiles, compound rubber, produce soap, glass, ceramics, paper, etc. These are industries that use chemicals to treat other raw materials.

These distinctions do matter to the makers of chemicals. We recognize instinctively the clean-cut differences between producing, converting, and consuming chemicals. But unless we ourselves speak precisely, and insist on the recognition of these groups, we have none but ourselves to blame if chemical production is confused with chemical consumption.

Prices and Prosperity Business is moving forward at a rapid rate. Our industrial consumption of cotton, wood pulp, wool, petroleum, several of the metals is shortly to be as great, or greater, than in 1929. Our current production of chemicals; that is, the gross tonnage volume of the whole industry, is estimated to be fifty per cent. greater than in that year. Prices of all industrial raw materials jumped upward during the last quarter of the old year, and in the same period wages advanced in all industries only a little less than ten per cent.

In the narrower confines of the chemical field, while prices have advanced less than the general industrial average, wages have increased more. However, the market has so expanded that this disequilibrium has not yet become a serious concern.

However, the fast-mounting costs of all American industries catches the watchful eye of any careful observer of our economic condition. This factor is thrown into unpleasant prominence by the higher taxes and the prospective shortage of skilled labor; and its possible effects are viewed with apprehension. As that capital economic critic, Col. Ayres, has recently pointed out, "there is always uncertainty whether it can be passed on, whereas a reduction in costs, other things being equal, is a sure road to increased production and employment."

We have often subscribed to this doctrine, and the chemical industry has in many instances proved its practical soundness. Nevertheless, if the rising tide is strong and fast enough, it is at least debatable whether or not chemical prices should as a matter of immediate, competitive policy be held down tightly.

Foolish Questions: Wise Answers Members of the Chemical Safety Council have to a man the same reaction to the recently propounded question: should safety rules infractions be punished? They agree this is a foolish question, and then promptly begin to discuss what the punishment should be and by whom it should be administered, all of which is the best proof in the world that safety is a serious matter, not a fad, to our operating staffs. This is certainly as it should be, for there are many and various hazards in the chemical plant, and experience has fully proved that they can be very greatly alleviated by thought and care.

Laws and Taxes Dominate Economics and Technology

The American Chemical Industry in 1936

ALMOST every activity of the American chemical industry during the past year, has been conditioned by governmental action. So true is this that, although the control has been indirect, nevertheless its effects have resulted in a number of important, abnormal developments. These effects we feel acutely. We can only perceive very dimly their final result.

Despite changes necessary to adjust to strange conditions created by novel legislation and in the face of formidable uncertainties that make future planning extremely chancy, chemical makers have made very great strides forward during the past twelvemonth. Physical production—gallons and pounds—has advanced: total income—dollars and cents—has not kept pace. Executives of companies with diversified lines talk privately of double and even treble output of some of the newer chemicals or those that enter into plastics, rayon, and resins; but they confess that some older, more staple industrial chemicals are only just beginning to top the pre-depression records. Averaging out all groups, the consensus of opinion is that our chemical output has gained about twenty-five per cent. over 1935 to an all-time high that is half again as great as the 1929 total.

Plant expansion has continued, and the industry's addition to its capital accounts for building and equipment was doubtless in excess of $125,000,000. This sizable total was reached without any such gigantic single new plants as Carbide's Whiting plant or National Lead's titanium plant completed in '35. Cyanamid has completed their new acid plant at Joliet, Ill.; Solvay has added a new bicarbonate of soda unit at Syracuse; Reilly Tar has built a new plant at Cleveland and doubled capacity at Fairmont; and Columbia Alkali has its new electrolytic chlorine and its new bicarbonate of soda operations in production. An interesting, significant new plant is the soya bean crusher and refinery of the Staley starch people at Decatur, Ill., costing $2,000,000, to which they are now adding a new chemical laboratory and enlarged power plant.

In estimating the plant expenditures of the past year and forecasting expenditures for the current twelve months we have been assisted, as in the past, by figures supplied in confidence by a representative group of eighteen companies. These firms* spent in 1936 $9,099,579.43 on land and buildings, and $23,894,918.87 on equipment and apparatus, or half a million for buildings and a million and a third for equipment.

Such figures do not begin to represent anything like the actual expenditures of the average company; but they do indicate quite accurately the comparative investment currently made in land and buildings compared with apparatus and equipment. Furthermore, it is exceedingly interesting to note that a year ago the average of these companies' estimates for their 1936 plant expenditures was $735,866, or rather markedly less than half as much as they actually spent. Common observation confirms these general results, and leaves one wondering how much of this excess over projected budgets is due to the new surplus tax which, like the old war profits tax, certainly puts a premium upon spending.

Now under construction and scheduled to come into production during the coming year are important additions to America's chemical capacity. A focal point of the lively revival of interest in the Tennessee phosphate fields will be the $2,000,000 electric furnace acid plant Monsanto will have in operation next summer. Chemical development in the deep South continues, a new type expansion being the ethyl fluid plant now building by the du Ponts near Baton Rouge at a projected cost of $2,800,000 with a capacity of 1,200,000 lbs. per month. To keep in line with this expansion, it is understood that Dow will step up bromine output at the Kure Beach seawater plant. Carbon black production will also be materially increased this year, notably by the daily burning of 70,000,000 cu. ft. of gas in a new $1,250,000 plant near Sunray, in Moore Co., Texas, in which the Shamrock and Continental Oil interests are allied with Wishnick-Tumpeer.

How rapidly a new synthetic chemical wins a market under favorable circumstances is evidenced by the big plant at Wilmington in which Atlas will make the two hexahydric alcohols introduced to the trade at the Chemical Exposition only thirteen months ago. Previously they had been laboratory curiosities selling in the neighborhood of $300 a pound. Today, though the supply is limited, prices are held down to 25c for Sorbitol and $1.50 for Mannitol. As both are capital hydrosizes, plasticizers, and softeners, interest in them is keenly stimulated by the low stocks and high prices of glycerin. This market situation, by the way, depends less upon munitions hoarding in Europe than on increased use of both glycerin and glycol in Cello-

* American Chemical Products, Anderson-Prichard, Bakelite, Henry Bower, Calco, Carbide & Carbon, Eagle-Picher, General Dyestuff, U. S. Industrial Alcohol, Oldbury, Mallinckrodt, Mechling Bros., Michigan Alkali, Monsanto, Mutual, Westvaco, Wishnick-Tumpeer and Niacet—a list compiled carefully to give a cross section of the industry and purposely omitting several of the larger companies in order to arrive at a more generally representative result.

phane, tobacco, and resins. Great Britain is the only important military power now depending chiefly upon cordite, while in this country the consumption of glycerin is actually greater in Winston-Salem than in Wilmington. The use of ethylene glycol as a hydrosize in cigarettes is growing—witness the advertisements of Philip Morris—and hardly a month passes that a new alkyd-type resin does not appear. Naturally these two new six-hydroxyl materials are interesting, and though no figures of expected output are given out, since Atlas is investing over a million dollars in the new plant, a substantial production is in the offing.

Old companies with new products are always interesting news. Penn Salt, for example, has gone into fish and vegetable oils at their Tacoma plant; Armour Fertilizer, at Navassa, N. C., is making sodium fluosilicate; the Portland (Ore.) Gas & Coke Company is recovering colloidal sulfur. The Victor Chemical Works have made a noteworthy contribution in their new needle form of trisodium phosphate and in three new, distinct forms of phosphoric acid.

New Products Progress

New products, which the past few years have been our most significant developments, seem overshadowed during 1936 by the industry's building program. This statement is qualified by realization that it is impossible to appraise properly the flock of new synthetic resins, new plasticizers, new wetting-out agents, any one of which may in time prove to have been more important than they now appear. "Pontalite," du Pont's new, clear, cold-setting thermoplastic has obvious possibilities, which is also true of the tough rubber-like material, "Vistanex," obtained by polymerization of iso-butene. The petroleum industry is greatly extending and diversifying its use of chemicals in its own refineries, and new specialties are being developed to meet this demand, notably Monsanto's flow-point depressant. Iso-propyl ether for aviation fuel, urea-ammonia liquor for fertilizers, anhydrous sodium orthosilicate for cleaning metals, Starkie's new synthetic pitch, Rohm & Haas' new organic base solvent, several forms of rubber coatings developed by Goodrich, and fluorinated waxes, all stand out as significant new chemical products, while in closely related fields we have spun glass, latex-impregnated paper, sanitized leather, cement-coated asphalt shingles.

Among the chemicals developing new uses borax and fluorine have made distinguished progress. To its spectacular use on indoor ski slides, borax has added two utilitarian markets which will conceivably become big tonnage consumers—as fuel mixed with pulverized coal and crude oil and as a decay retardant bath for fruit. The use of fluorine as a refrigerant (dichlorodifluoromethane) continues to grow and keen research is afoot for all sorts of fluorinated organics.

A new flotation process for the separation of potassium sulfate from sodium and potassium chlorides presents one solution of a techno-economic problem in our southwestern mines, while butyric acid by fermentation from molasses has more than theoretical interest for the alcohol industry in this country. But the most interesting technical developments cluster about apparatus and equipment. Better control and more automatic operation are furthered by several new devices: a pressure compensator for flow meters (Foxboro); a pyrometer that in one instrument indicates, records, and signals (Leeds & Northrup); spectrograph analysis (General Electric); a CO_2 flow meter (Republic); the Shadowgraph scale which by eliminating all indicating mechanisms reduces the number of working parts by a third. Filtering technique is advanced by corrosion-proof press plates (Sperry); by the possibility of filtering under pressure up to 1000 lbs. per sq. in. (Shriver); by a continuous, automatic water filter (Adams). A new departure in the principle of the gyratory pulverizer is embodied in the "Centriflex," and while not strictly within the year's developments, the so-called ultra and the free-wheeling centrifuges have demonstrated their efficiency and usefulness.

The accomplishments of 1937 in new plants, new products, and new processes have been substantial; but it is commercial and financial developments which have riveted the attention of the industry's leaders. In this strictly business sector the intra-consolidation of the chemical companies and the changes in the chemical marketing methods are conspicuously prominent. Both are the direct result of recent federal legislation.

Consolidation of Subsidiaries

On New Year's Day 1936 Innis Speiden absorbed its manufacturing subsidiary, the Isco Chemical Company. Since that day a constant succession of similar consolidations have been made. Du Pont is fast integrating into a single corporation and has assimilated Grasselli, Cellophane, and Rayon. Hercules has absorbed Paper Makers Chemical; Virginia-Carolina, the Phosphate Products Corp., Diamond Alkali, both Standard Silicate and Standard Chromate. The Koppers Co. has become Koppers United, embracing all its subsidiaries save only Maryland Drydocks, White Tar, and the Wood Preserving Corporation. These are but a few typical samples of a movement that has gone through all branches of the chemical industry.

This lusty gobbling up of subsidiaries is easily understood. Not only does the new federal tax take an extra slice of at least 2% off profits turned over to a holding company, but the holding company itself is distinctly out of favor in Washington so that there is always the threat of dangerously punitive legislation. Whether or not this forced consolidation is wise, it is plainly expedient. It is rapidly making the big units bigger and, of necessity, more cumbersome. From a practical operating point of view, much can be said

for smaller units that stand on their own feet. Profits —or losses—of departments are not so readily recognized. On the other hand, consolidation does knit the organization more closely and it does create opportunities for economies. This unwitting prompting of consolidation by an Administration that frankly espouses the cause of the smaller independents is another confusing contradiction in recent legislation.

One of the Government's avowed helps to small business, the Patman Law, designed to prevent unfair price discrimination between big and little buyers, is having profound, but again contradictory effects upon the marketing system of the American chemical industry. It has forced our chemical makers to study the costs of selling, and generally they have found that the discounts given for large contracts have been too liberal while charges for less-than-carload deliveries have not been sufficient. This strengthens the position of the local distributor; but closing up the spread in discounts tends at once to raise the chemical costs of all buyers and at the same time to freeze the price schedules. Accordingly, while the chemical jobber stands to win, the ultimate consumer will lose.

Correcting the Cash Discount Abuse

Steps have already been taken under the Patman Law to correct certain abuses that during hard times have crept into the chemical merchandising system. General Chemical Company announced a month ago that in the future their terms would be thirty days net. Grasselli and Monsanto promptly followed this good example, and many companies are thus eliminating the much abused "2%, 10 days" cash discount. The industry, particularly the larger companies, is taking the Patman Law seriously, and throughout the past contract season strove manfully to bring sales in line with its rather cryptic provisions. One notes a growing friendliness to the new law among our major executives. A simplified and clarified version might even rouse enthusiasm.

Not even a modicum of this popularity is being won by the new surplus tax. No tax law is popular. But this tax law is feared because it is forcing the distribution in dividends of surplus funds by an industry that requires large cash reserves. Technological progress makes for high obsolescence. Chemical operations are notably destructive of plant. The industry must therefore always be prepared to make unusual capital investments. Furthermore, higher wages and credit expansion are creating a dangerous situation in which another smash appears to many to be inevitable.

But the least popular of all Governmental moves are the tariff treaties. Because chemicals are essential to national defense, Secretary Hull solemnly promised the representative of the industry a year ago that he would tamper with no chemical schedules until consulting with him. This promise has been repeatedly ignored. The result—chemical exports are up 15% while imports have risen 25%. More serious, however, is the fact that big sections of our domestic chemical markets have suffered from price raids by imported materials.

Despite these disquieting factors, the American chemical industry is planning the biggest production program ever undertaken. Something more substantial than a happy-go-lucky spirit of making-hay-while-the-sun-shines underlies this optimism. It rests on a firm belief that the future of this industry is bright because the use of chemicals in all industries will increase as the substitution of synthetic for natural materials continues.

Solvent Extraction In Petroleum Field

In its search for new and better fuels to use in powerful aviation engines as well as in the ordinary motor car, the petroleum industry is learning to eliminate undesirable substances in gasoline and to control its molecular structure by solvent extraction in place of fractional distillation, Prof. Merrell R. Fenske and Dr. K. A. Varteressian of Pennsylvania State College stated recently in addressing the A. C. S. Symposium on Absorption and Extraction at Columbia University.

Fractional extraction, it was explained, contrasts with fractional distillation in that in the former process the constituents of the oil when "washed" with liquid solvents separate because of their different solubilities, while in distillation the separation depends upon their vaporization at different boiling points.

Experimenting with a particular hydrocarbon mixture which is likely to occur in most petroleums or in most gasolines—methylcyclohexane and normal heptane—the chemists were able to achieve the desired separation of the hydrocarbons in the course of ten extractions, whereas as many as 100 distillations would be required to get the same result.

"Since it is now clear that methylcyclohexane exhances the octane number, or antiknock measuring stick, of a fuel while normal heptane depreciates its octane number, refiners are becoming interested in the problem of whether or not such separations here exemplified could possibly be made on an industrial scale," declared Prof. Fenske, who is head of the division of industrial research in the School of Chemistry and Physics at Penn State.

"The results of our experiments clearly set forth the increased suitability and efficiency of fractional extraction. Comparisons of the energy requirements necessary to separate these two hydrocarbons show that fractional extraction is a more efficient process and takes less energy.

"Thus it appears for the first time that a sharp and clear-cut comparison of the two methods of fractional distillation and fractional extraction for the purpose of separating materials as exemplified by these two hydrocarbons is now available.

"Our work has been related specifically to this definite hydrocarbon mixture and the comparisons are made entirely on this basis. However, from a study of the results obtained on this mixture it will undoubtedly be possible to realize more clearly and apply the same basic principles to many other problems of petroleum refining, which will ultimately lead to still better fuels and lubricants."

F. J. Appel and Prof. J. C. Elgin of the department of chemical engineering of Princeton University reported that the spray tower method of solvent extraction can be made more efficient than the packed column. One of the most important requirements for extraction equipment is that it permits a large surface of contact between the liquid to be treated and the solvent.

Chemical Chronology, 1936

January T. S. Grasselli resigns Grasselli presidency and becomes member of du Pont Executive Committee. ¶ Belknap goes to St. Louis as Monsanto executive vice-president and Rand succeeds as Merrimac head. ¶ Theodore Swann returns to the chemical fold with Swann & Co. ¶ Innis, Speiden absorbs Isco subsidiary. ¶ Coopers Creek Chemical under new president, A. M. Simpson, enters the chemical specialty field. ¶ Lauren B. Hitchcock, University of Virginia, heads Hooker Electrochemical's technical sales division. ¶ Norman Sheppard, Firestone, takes charge of Cyanamid's consumer technical service. ¶ Dr. W. M. Loften is Penn. Coal Product's new research director. ¶ Dowell Patents upheld. ¶ Watson, I. A. C., president, and Bell of Cyanamid elected to the Board of the National Association of Manufacturers. ¶ Caesar Grasselli, III, to London as du Pont's manager. ¶ C. F. Hockley heads reorganized Davison Chemical. ¶ Prof. Adams, Illinois, is the Willard Gibbs medalist. ¶ Ill health forces resignation of Hercules' Vice-President, N. P. Rood. ¶ Jacobs, Electro Bleaching Gas, heads the Chlorine Institute. ¶ Cady, U. S. Finishing, is new president of Textile Chemists & Colorists. ¶ January chemical consumption disappointing. ¶ Cyanamid announces a $500,000 acid plant at Joliet, Ill. ¶ Cold weather holds up raw paint materials sales. ¶ Allied calls preferred stock for redemption Feb. 14th. ¶ Plan for readjustment of Anglo Chilean Nitrate is formulated. ¶ Deaths: Benjamin K. Hotchkiss, Hooker; William Lynn, 91, president, William Lynn Chemical, Indianapolis; Warren Mathews Foote, 63, president, Foote Mineral.

February Monsanto ends subsidiaries, but retains Merrimac name, and takes over Thomas & Hochwalt "Labs." ¶ U. S. Circuit Court of Appeals rules Paramet did not infringe Kienle resin patent, as alleged by G. E. ¶ Thorne L. Wheeler is elected a vice-president, A. D. Little, Inc. ¶ Wyatt appointed assistant sales manager, Warner Chemical. ¶ Godfrey L. Cabot gives $144,000 to the cause of aeronautics. ¶ Dr. Charles L. Reese honored by Heidelberg, his alma mater. ¶ The du Pont Co., recognizing shortage of trained researchers, establishes 12 additional fellowships. ¶ Industrial chemical purchasing still below earlier expectations. ¶ Shortage in naphthalene serious. ¶ TVA declared constitutional. ¶ Chemical stocks gain $58,869,631 in February. ¶ Extra dividends; Pittsburgh Plate Glass $1; Atlas Powder 25c. ¶ Cold weather retards business. ¶ Deaths: Dr. George David Rosengarten, 67, former A.C.S. president and P-W-R executive; Christian Brevoort Zabriskie, retired Pacific Coast Borax pioneer; Morris R. Poucher, 76, retired du Pont official and a leader in the founding of U. S. dye industry; C. O. North, 45, Ohio-Apex general manager, following an explosion in his laboratory; Dr. Irving W. Fay, 75, professor emeritus, Brooklyn Poly and noted dye chemist; Arthur W. Clark, 57, Kentucky Color & Chemical head.

March Hull tariff pacts increase imports of certain chemicals, statistics show. ¶ Allied seeks to prevent SEC from publishing company's sales figures. ¶ Haskins Soap seeks injunction to stop payment of coconut oil excise tax collections to the Philippine Government. ¶ Haskell, U. S. I., heads Salvation Army's chemical division in fund drive. ¶ Henry W. Johnstone, Merck Rahway plant manager, elected a v.-p. and placed in charge of operations. ¶ International Nickel elects as vice-presidents, Merica, MacAskill, and Evans; Thompson is made executive v.-p. ¶ Fred E. Stuart, formerly Industrial Chemical Sales, heads a new company, Activated Alum. ¶ MCA opposes Lonergan Pollution Bill. ¶ Du Pont demonstrates new oil turbine ultracentrifuge which multiplies force of gravity one million times. ¶ Cresylic acid shortage forces higher prices while citric is reduced 1c. ¶ Consumption of chemicals expands seasonally. ¶ Competition in acetone noted. ¶ Stock values again rise. ¶ V.-C. directors approve retirement of 7% cumulative prior preference stock. ¶ J. M. McCoy elected to du Pont Executive Committee. ¶ Deaths: Albert Huntington Hooker, 70, technical director, Hooker Electrochemical; Adolf Kuttroff, 89, dean of the dyestuff trade; Dr. George A. Prochazka, 80, U. S. dye pioneer; William Augustus Hamann, 75, former R. & H. president; Thomas F. Connelly, 42, prominent in the wood distillation field.

April Investigations of alleged lack of competition in the potash and fertilizer industries proposed. ¶ Technicians sharply disagree at A.C.S. meeting over merit of alcohol-gasoline fuel blends. ¶ Dr. George O. Curme, Jr., Carbide, receives the Elliott Cresson Medal, Franklin Institute. ¶ The Charles Herty Medal awarded to Walter H. MacIntire, TVA consultant. ¶ Two hundred "soapers" lose their collective $26,000,000 coconut oil processing levy tax case. ¶ Allied Industrial Chemical opens an industrial alcohol producing plant in Brooklyn. ¶ U.S.I. names J. Tenney Mason and Harry M. Sloane vice-presidents. ¶ Dow stockholders increase authorized non par value stock from one to two million shares and the preferred from 30,000 to 60,000 shares. ¶ Iodine prices slashed. ¶ Naphthalene shortage becomes acute. ¶ Carbide's president, Jesse Ricks, reports a $20,000,000 construction budget to stockholders. ¶ Stocks crash in April after having reached a 5-year peak in March. ¶ Monsanto reports $1,071,691 net in first quarter. ¶ Business recovery reaches 6-year peak; chemical consumption spurts. ¶ P.&G. buys Cincinnati Soap. ¶ E. F. Houghton & Co. engages Dr. Irving S. Saxl, noted textile physicist. ¶ Dr. Edwin A. Robinson, formerly in charge of Tennessee-Eastman's development work, joins National Oil Products. ¶ Du Pont announces move of Cellophane, Grasselli, Rayon headquarters to Wilmington. ¶ Naval stores industry opens new season with prices soft; producers form the American Turpentine Farmers' Association and plan to restrict output. ¶ Deaths: Albert Farwell Bemis, 65, chairman, Bemis Bag and Atlantic Gypsum Products; William Charles Peyton, 67, founder, Peyton Chemical (now part of General).

May French tariff pact lowers U. S. rate on several important chemicals. ¶ Monsanto contracts for TVA power for new phosphate plant near Columbia, Tenn., voting $6,000,000 for expansion. ¶ Cyanamid takes over the sodium aluminum sulfate operations of Calumet Chemical and Victor transfers Calumet's mono-calcium phosphate operations to West Nashville, Tenn. ¶ Cyanamid also acquires Harrison Refining, wax refiner with plant at Belleville, N. J. ¶ Toch heads A. I. C.; Institute's medal is presented to Dr. Marston T. Bogert, Columbia. ¶ Dr. F. G Zinsser elected president, Chemists' Club (N. Y.). ¶ One thousand agriculturists, industrialists, and scientists attend sessions of the 2nd Farm Chemurgic Council meeting. ¶ Prof. William F. Giauque, California, receives the Chandler Medal. ¶ American Association of Cereal Chemists award the Thomas Burr Osborne Medal to Dr. Morris Joslin Blish, Nebraska. ¶ Dr. Julius A. Nieuwland, Notre Dame, receives the Mendel Medal. ¶ Fort Washington Chemical formed; Alex C. Fergusson to act as sole distributor. ¶ Armour Fertilizer breaks ground for a sodium fluosilicate plant at Navassa, N. C. ¶ Ethyl cellulose price reduction announced, another example of successful policy in increasing production and widening appli-

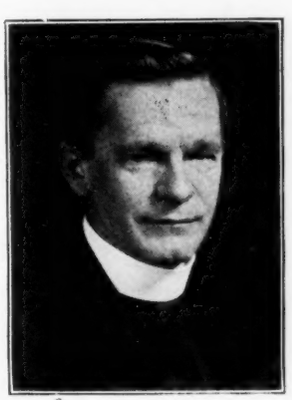
cation. ¶ Naphthalene and cresylic shortages continue. ¶ Acetone is again reduced. ¶ U. S. I. halves dividend; due to highly competitive alcohol prices. ¶ Columbian Carbon declares a 50c extra. ¶ Cyanamid nets $738,015 in the first quarter. ¶ Other quarterly statements show improvement in net earnings over previous year. ¶ Chemical consumption in heavy volume. ¶ Group of German phosphate manufacturers tour the U. S. ¶ A. S. T. M. appoints a committee to develop standard soap and detergent specifications. ¶ Deaths: Frank C. Thornton, a pioneer drum manufacturer; Arthur R. Murphy, 37, in charge of du Pont's azo colors division; Col. Beverly W. Dunn, 75, inventor of "Dunnite" explosives; George William Sargent, 63, former head of the Molybdenum Corp.

June President Martin H. Ittner, A. I. Ch. E., heads American delegation to the London International Chemical Engineering Conference. ¶ Dr. Alan Philip Colburn, young du Pont chemical engineer, receives the first William H. Walker award. ¶ E. M. Allen, Mathieson, is elected M. C. A. president. ¶ Battelle Institute adopts new plan for training younger research workers. ¶ Dr. Duncan A. MacInnes, Rockefeller Institute, new president of the Electro-Chemical Society. ¶ Over 170 gather at the American Leather Chemists' Association Skytop meeting, A. C. Orthmann is elected president. ¶ Hercules acquires I. G. flake cellulose acetate process and plans production by December. ¶ Reilly Tar & Chemical plans new plant at Cleveland. ¶ M. E. Leeds, president, Leeds & Northrup, receives two honors, the Gantt Medal of the Institute of Management and Brooklyn "Poly" confers degree of Doctor of Engineering. ¶ Norman Harold Fyffe, formerly with Joseph Turner, joins Oldbury Electro-Chemical and opens N. Y. City offices. ¶ National Sanitary Supply Association meets in N. Y. City; the National Association of Insecticide and Disinfectant Manufacturers reunes as usual to the Edgewater Beach in Chicago for the semi-annual convention. ¶ Col. Robert Marsh, Jr., elected president, Potash Co. of America. ¶ John W. Hassler made director of research, Industrial Chemical Sales. ¶ Hagar and Sidford are elected directors of Titanium Pigment. ¶ E. M. Clark of Barrett is elected to the board of American I. G. ¶ Peak in naphthalene demand passes and price recedes. ¶ French ochres lowered in price as a result of the French Tariff Pact. ¶ Fertilizer industry undertakes a "self-government" plan with the Federal Trade Commission. ¶ Heavy buying of chemical stocks by investors reported. ¶ American Potash & Chemical declares $1 distribution on the common. ¶ June industrial pace above normal seasonal level. ¶ R. C. Watson in newly formed essential oil firm, Firmenich & Co. ¶ Deaths: Rev. Dr. Julius A. Nieuwland, 58, Notre Dame scientist; Arthur Amos Noyes, 69, director of Gates Chemical Laboratory, California Institute of Technology; Dr. Lucius Pitkin, 76, consultant.

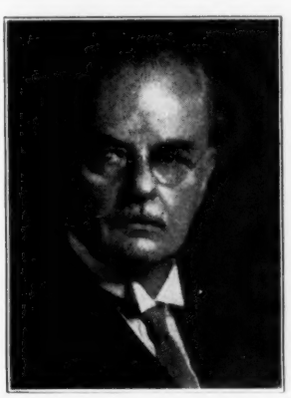
July Treasury Department authorizes new completely denatured alcohol formulas to end complaints about odors. ¶ Charles A. Bigelow, is elected a vice-president and member of Hercules' executive committee. ¶ Charles M. Hollwedel, Warner, joins Joseph Turner & Co. ¶ Eagle-Picher Lead appoints Harold R. Harner chief chemist. ¶ Mefford Chemical becomes sole distributor for the iodine products of Deepwater Chemical. ¶ Baekeland is honored by the Royal Society of Edinburgh. ¶ Cresylic advanced again. ¶ Citric is reduced 1c. ¶ Chemical common stocks lead in strong market advance. ¶ Air Reduction nets 75c in 2nd quarter. ¶ Commercial Solvents nets $466,170 in the June quarter, a decline from $534,795 in the corresponding period of '35. ¶ Mathieson earns 46c against 31c a share in 2nd quarter of previous year. ¶ Texas Gulf Sulphur, Carbide, and Catalin report improved earnings. ¶ Producers of pyrethrum form an association. ¶ International Printing Ink acquires Standard Printing Ink, Cincinnati. ¶ Deaths: Sir Henry Wellcome, 83; Col. Thomas F. Meehan, 55, president, James Good, Inc.; John W. Paisley, 62, Gillespie-Rogers, Pyatt Shellac research director; Dr. Joseph N. Harper, 62, American Potash Institute.

August Industrialists discuss "What Industry Wants from Its Chemists," at a symposium at the Pittsburgh A.C.S. meeting. ¶ Columbia Alkali announces plans to produce chlorine. ¶ Three regional Chemurgic Conferences planned. ¶ Du Pont releases sound picture "The Wonder World of Chemistry," for general public showing. ¶ Unyte merged with Plaskon and a new corporation, the Plaskon Co., is formed. ¶ George Merck is host at house warming of company's new $200,000 administration building at Rahway, N. J. ¶ National Aniline and Davison announce vacations with pay for plant workers. ¶ Standard Oil Development makes important changes in personnel; technical division is headed up by R. P. Russell, vice-president and general manager. ¶ W. H. Pesola, formerly with the Vita-Var Corp., joins Imperial Oil & Gas as director of research. ¶ Joseph Turner's plant and warehouse at Ridgefield, N. J. nears completion. ¶ Bergius, noted German chemist, in the U. S. for the A.C.S. meeting, defends Nazi regime. ¶ Gustavus J. Esselen, Boston consultant, is the National Research Council's representative to the 12th Conference of the International Union of Chemistry at Lucerne. ¶ Very little "usual summer dullness" reported by chemical producers. ¶ Mercury, advancing slowly all year, reaches $80 a flask when Spanish revolution cuts off supplies. ¶ Benzol down 2c. ¶ Alcohol schedules are raised. ¶ National Carbon is victor in activated carbon suit against The Zapon Co. ¶ Fertilizer companies' balance sheets reflect price competition. ¶ Stocks rise slightly. ¶ Extras declared include a 25c extra by Monsanto, 25c by Heyden, 10c by Westvaco, 12½c by National Lead, and a 15c increase in the regular dividend rate by United Carbon. ¶ Second quarter earnings statements make pleasant reading.

Christian Brevoort Zabriskie



Father Julius A. Nieuwland



William A. Hamann

Theodore B. Wagner

¶ Westvaco proposes issue of 250,000 shares of 5% convertible preferred and a 260,000 share increase in the common. ¶ With Dr. W. H. Tisdale in charge, pest control research "labs" of Grasselli are reorganized and moved from Cleveland to Wilmington. ¶ Deaths: Walter A. Layfield, 64, retired Atlas Powder vice-president; John William Hirst, 80, well-known in linseed oil manufacturing circles; Irvin F. Lehman, president Blaw-Knox.

September Lee A. Keane moved from Chicago branch to general sales manager, U. S. I. ¶ Sulfur companies fight higher state taxes in Louisiana and Texas. Chemurgic Council takes violent exception to report of U. S. Consul Sydney B. Redecker that alcohol is losing favor in Germany as a motor fuel because of its inefficiency. ¶ Du Pont's "Cavalcade of America" returns to the air. ¶ United Chromium receives set-back in patent suit. ¶ Du Pont announces plans for a new $2,800,000 tetra-ethyl plant at Baton Rouge. ¶ Details of Monsanto's $2,000,000 phosphate plant released. ¶ Still another bromine producer in the field, Great Lakes Chemical, Manistee, Mich.; given permission to sell 400,000 shares. ¶ William A. Harshaw becomes chairman of Harshaw Chemical and his son, William J. Harshaw is elected president. ¶ Harold K. Work new director of research, Jones & Laughlin. ¶ Landis selected to receive Chemical Industry Medal. ¶ Thomas Midgley announced as '37 Perkin Medalist. ¶ Elwood L. Bean, Providence chemist, receives the Dexter Brackett Memorial Medal at the New England Water Works Association's meeting. ¶ William P. Yant, Bureau of Mines, joins Mine Safety Appliances, Pittsburgh. ¶ Michigan Chemical, St. Louis, Mich., new bromine producer, opens plant. ¶ Industrial chemical consumption increases as general business conditions improve further. ¶ Mercury soars to $90. ¶ Columbia Alkali to make "bicarb." ¶ Charles Kelly crowned golf "champ," Salesmen's Association. ¶ Sulfonated Oil Manufacturers' Association holds two-day meeting at Oreland, Pa. ¶ U. S. I. celebrates 30th birthday. ¶ General Plastics declares a stock dividend. ¶ Rayon production at record levels; shortage in late fall feared. ¶ Chrome yellow price "war" ends and price advances. ¶ Naval stores restriction scheme withdraws 14,000,000 cups from production. ¶ Steady decline in Chinawood oil from the 40c high of last fall continues. ¶ Federal Trade Commission releases proposed trade practice rules for the fertilizer industry; disappointment voiced that plan lacks "teeth" to stop price cutting. ¶ Cresylic acid shortage still acute. ¶ A. A. C. plans to retire 13,305 shares of capital stock in the treasury. ¶ Penn. Salt raises dividend rate from 75c to $1. ¶ Hooker pays $1.50 on account of accumulations on the 6% preferred. ¶ Deaths: George Hasslacher, 41, former official of R. & H.; Fred L. Somers, 37, Lavanburg Dry Color vice-president; Francis C. Goldsborough, 51, U. S. I. eastern sales manager; Prof. Alfred White, 32, University of Virginia; A. G. Watt, president of the Cleveland jobbing firm of that name.

October Koppers, du Pont, Davison Chemical, V.-C., and Hercules consolidate subsidiaries and simplify their respective corporate structures. ¶ Miner of du Pont heads chemical section, National Safety Council. ¶ Breyer succeeds Wright as president, Association of Consulting Chemists and Chemical Engineers. ¶ Dean Whitmore to receive Nichols Medal in '37. ¶ National Carbon wins activated carbon suit against Western Shade Cloth. ¶ Wishnick-Tumpeer enters activated carbon field. ¶ Columbian Carbon opens laboratory for the study of applications of colloidal carbon black. ¶ Dow Chemical opens Chicago office with Wilson Doan in charge. ¶ Industrial chemical tonnages at year's peak. ¶ Texas legislature increases sulfur tax to $1.03. ¶ Glycerine's steady price climb continues. ¶ Mercury goes to $93. ¶ Hammond Paint & Chemical takes over a larger plant at Beacon, N. Y. ¶ Titanium pigments reduced ¼c; lead pigments advance as the price of metal goes higher. ¶ Turner & Co. moves main office to Ridgefield, N. J.; N. Y. City office made a branch. ¶ Alcohol price structure weakens slightly. ¶ Wishnick announces plans for huge carbon black plant in Texas. ¶ Market stock values at highest point since October, '30. ¶ Monsanto's 3rd quarter sales and earnings constituted an all-time peak. ¶ Vanadium stockholders approve capital reduction. ¶ J. T. Baker Chemical declares $1 dividend. ¶ Usual pre-election slump in business fails to appear. ¶ J. Rivers Adams is appointed resident manager of Westvaco's Carteret, N. J. plant. ¶ Industrial Colloids & Chemical enlarges Knoxville plant. ¶ Onyx Oil & Chemical enters the tanning chemical specialty field. ¶ Deaths: James T. Skelly, 59, Hercules vice-president; Chester A. Howe, Carbic Color & Chemical vice-president; Robert H. Adams, 68, one-time American Linseed president; Oliver Gould Jennings, 71, U.S.I. director.

November Du Pont, Carbide, Calco, Dow and others announce wage increases for plant workers; Hercules, Monsanto, Standard of N. J., Eastman Kodak and Atlas pay bonuses. ¶ William B. Bell re-elected president, Chemical Alliance. ¶ Diamond jubilee of the U. S. patent system banqueted in Washington. ¶ Diamond Alkali absorbs Standard Chromate and Standard Silicate as divisions. ¶ Prior Chemical continues as sole distributor of Standard bichromates. ¶ Allied Chemical eliminates Atmospheric Nitrogen and transfers assets to Solvay. ¶ Koppers to build 59 new by-product ovens for Inland Steel; solvents recovery units will also be remodeled. ¶ General Dyestuff-General Aniline move to new building at 435 Hudson st., N. Y. City. ¶ United Chromium granted rehearing of patent suit against General Motors. ¶ A. E. Starkie Co., Chicago, markets new synthetic pitch. ¶ Alkali carlot prices repeated for '37. ¶ Bichromates are advanced ⅛c for spot delivery. ¶ Carbon black prices are renewed unchanged. ¶ Atlanta convention of National Fertilizer Association attended by 429. ¶ Acetone reduced 1c. ¶ Alcohol prices are raised 3c through the first quarter of '37. ¶ Stocks again rise in a post-election boom. ¶ Cyanamid earns $2,803,266 in the first 9 months. ¶ Kerm elected president, Stanley Chemical. ¶ Moses Gomberg and William Foster elected honorary members, A.I.C. ¶ Morehead Medal is awarded to Dr. David Schenck Jacobus, Babcock & Wilcox, by the International Acetylene Association. ¶ California Alkali Export Association is formed. ¶ Lithopone is reduced ¼c; lead pigments are again advanced. ¶ Naval stores prices have spectacular rise. ¶ Coconut oil prices soar and quotations are strictly nominal. ¶ Deaths: Dr. Theodore B. Wagner, 67, chemicals from corn pioneer and consulting editor CHEMICAL INDUSTRIES; George Stanley Robins, 44, St. Louis distributor; William S. Rowland, 55, president, Stanley Chemical.

December August Merz elected for the 10th time president of the S.O.C.M.A. ¶ The Patman Act causes chemical producers to readjust a number of price schedules. ¶ William B. Eddy, Rochester Germicide, re-elected president of the disinfectant and insecticide makers' association. ¶ Chandler Medal awarded to Dr. John H. Northrop of the Rockefeller Institute. ¶ Freeport Texas becomes Freeport Sulphur Co. and reduces stock. ¶ Dr. Frank C. Whitmore is president-elect of the A.C.S. ¶ Chemical distributors plan a definite trade association. ¶ Paul Harrison retires from U.S.I. after a half century of service. ¶ Dow Chemical successfully offers a new issue of $5,000,000 debentures. ¶ Du Pont moves several departments into their new Nemours Building, Wilmington. ¶ December chemical tonnages are heavy and the industry closes one of the big tonnage years of its history. ¶ Deaths: Robert B. French, in charge of eastern glycerin sales for Harshaw Chemical; Thomas Bell, connected with Charles Lennig & Co. for 60 years; Hugh P. McCormick, vice-president, McCormick & Co., Baltimore.

BICHROMATES

The Chemical Key to Leather, Cloth, and Paint

Bichromate is essential for dry colors

ALTHOUGH the shoes on his feet, the clothes on his back, the buildings in which he lives and works, the car he drives, the golf club he swings, could not be, save for bichromates, nevertheless to Mr. Man-on-the-Street they are not even a name he knows. Bichromates' place is in the wings, decidedly "backstage."

To the chemist, however, bichromates are powerful oxidizing agents. To the tanner they furnish the means of shortening an ancient, time-consuming operation. To the dry color manufacturer they are the primary material for yellows and greens; to the dyer, an indispensable mordant. The electroplater must have chromic acid, derived from sodium bichromate. The brass manufacturer brightens the color of his products with it. Few industrial chemicals, indeed, have wider application. Where once, the principal, indeed, the only use of chromite ore was in the production of chrome chemicals this now ranks a poor third. Metallurgical and refractory uses have expanded tremendously in the last two decades.

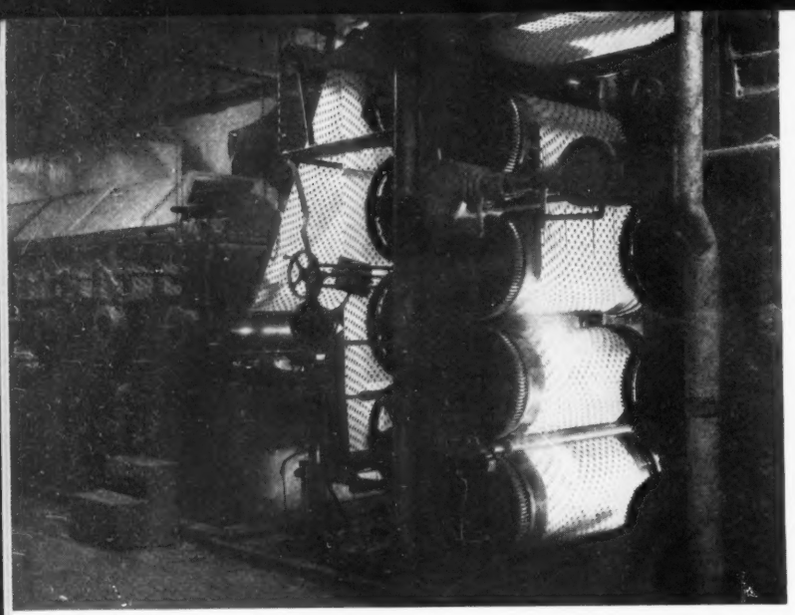
No prospect of a chrome shortage threatens, but unfortunately commercially workable deposits of ore are all situated in the world's most inaccessible outposts—New Caledonia, Rhodesia, India, Russia, and Turkey. It has been aptly said, 'the chrome business has one foot in a railroad car, the other on a tramp steamer—this situation results in many economic and political problems which worry everyone but the steamship companies'.

The element chromium was discovered in 1797 by Vauquelin, who named it from the Greek word *chroma,* which means color. The first chrome-bearing ore in the United States was found in 1810 on the Maryland-Pennsylvania boundary. As one of the producers has delighted to relate in their advertisements, one Isaac Tyson, a trained chemist, discovered that a stone he used to chock a cider barrel contained chrome ore. The Tyson Mining Co. was formed and ore from the Reed Mine near Jarrettsville, Md., was shipped abroad in large quantities. A year later (1828) Wood Mine was discovered in Lancaster Co., Pennsylvania, but not until 1845 was the first plant for producing bichromate of potash built in Baltimore. Shipments from the Pennsylvania-Maryland area from 1827 to 1882 have been estimated at 250,000 tons of ore averaging about 40 to 63 per cent. Cr_2O_3. High grade ore from Turkey about 1860 killed the foreign markets for domestic ore, and between 1870 and 1880 our chromite mining almost vanished. Turkey was chrome headquarters until the development of the New Caledonian mines late in the 19th century.

Till 1884, when chrome tanning was introduced, the chief use of the potash salt was in making chrome yellows and greens. Although Knapp in 1858 described a practical method of employing bichromate for the tanning of skins and Cavalin had described a method even earlier, it remained for Schultz to patent a feasible process. This big, new use of bichromate spurred workers to produce a cheaper salt and in 1885 sodium bichromate was produced commercially.

In Schultz's process, now known as the two-bath process, skins were treated in a solution of bichromate of potash and hydrochloric acid, followed by a bath of a "hypo." Sodium bichromate has largely replaced the potash salt and sulfuric, the hydrochloric acid. In 1893 Martin Dennis patented the so-called "one-bath tannage" process. In the two-bath process the sodium bichromate is reduced in the skins whereas in the one-bath process the bichromate is first reduced and the reduced liquor is used for tanning. In the two-bath process the tanner uses the bichromate directly, in the one-bath process bichromate is used by the producer to make the basic liquor.

With the exhaustion of the mines in Pennsylvania other domestic deposits were eagerly sought but without success. Chrome ore was discovered in New Caledonia by Garnier in 1866, ninety-two years after a Captain Cook had discovered the South Seas island. The first mine was opened in 1880 in Bernheim and



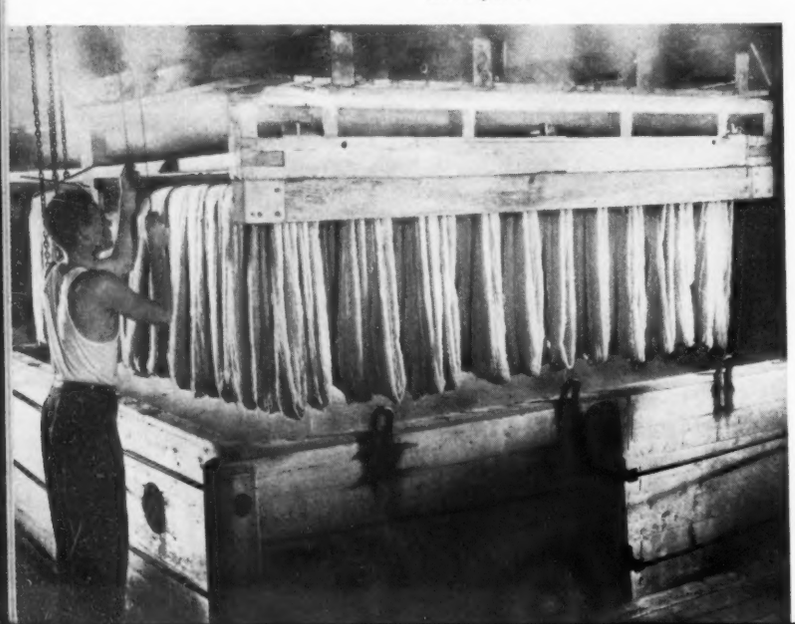
Bichromates as mordants and developers are essential in the print cloth industry.

in 1901 and 1902 larger deposits were opened up. Approximately 1,600,000 tons of ore have been shipped from New Caledonia to date.

Since 1900 new deposits have been discovered in various parts of the world, the principal one in Rhodesia (1906) and the latest one of importance in the Philippines. For several years Southern Rhodesia was the world's largest producer of chromite, supplying about 40 to 45 per cent. of the world's total; last year Russia probably ranked first, Turkey, second, Southern Rhodesia, third, and Union of South Africa, fourth. Africa and New Caledonia supplied most of the United States imports.

During the war difficulties of shipping facilities turned attention to low-grade deposits in Canada, Cuba, and South America. Often a concentrating step at the mines was necessary and operations proved uneconomical and have been discontinued. Large quantities of low-grade ore are known in Cuba, South Africa, Japan, the Philippines, and the United States, in addition to millions of tons of low-grade ore in the principal producing countries. These remain untouched if they fall below a minimum content of 47-48% Cr_2O_3. Thus

Bichromates in the dye kettles weave clean, luminous colors on wool yarn.



domestic production is negligible. In an emergency the United States could produce 25 to 30 per cent. of its requirements. The estimated two years war needs of chromite are 300,000 short tons of 50 per cent. ore. Fortunately, American capital is interested in certain New Caledonian and Rhodesian mines. There is some agitation to have the government build up a reserve stock to be held inviolate against an emergency.

While New Caledonia now ships a much smaller percentage of the total world's supply than formerly, the ore is highly prized for chemical purposes. Approximately 13 per cent. of the total importations of chromite into the United States from all sources is consumed by the chemical industry. The producer of bichromates requires an ore with a chromic acid content of 47% or better, is not fussy about the iron content provided it does not exceed 15 per cent., although he naturally prefers a low content. The silica content should not be above 8% and preferably under 5%. He insists that it be be low in sulfur and easily crushed.

Although radical improvements have been made in furnace design, in mechanical puddlers and other engineering devices, the chemistry of sodium bichromate from chrome ore remains practically unchanged from the original process. An electrolytic process was developed at Niagara Falls, but operations were discontinued within a few years and the method has never been employed since.

Sodium bichromate, $(Na_2Cr_2O_7) \cdot 2H_2O$, is produced by roasting finely pulverized ore with soda ash and lime in an oxidizing atmosphere and with frequent stirring. The sinter formed is cooled and the soluble content of alkaline sodium chromate is dissolved by leeching with water. The alkaline liquor is purified, concentrated by boiling, and addition of sulfuric acid forms the bichromate. The solution is again purified, concentrated, crystallized, and then dried. In some cases the concentrated liquor is shipped. The bichromate industry is one of the largest consumers of soda ash and lime.

Consumption of bichromates by the tanners probably exceeds that used by the color makers but the margin is slight. Chrome tanning works in a much shorter time cycle than bark tanning, and produces leather of greater resistance to heat and moisture. Hence most upper shoe leathers are chrome tanned. Each tanner has set ideas on methods. Therefore, operations vary quite widely in the industry, but roughly a formula of 50 pounds of bichromate of soda, 50 pounds of 66 degree sulfuric acid, and 25 pounds of 42 degree glucose syrup is employed for light leathers. For heavy leathers about 40 pounds of acid are used.

For chrome yellows and chrome greens sodium bichromate is one of the principal raw materials. Yellow is made by reacting a solution of sodium bichromate with a soluble lead salt, litharge dissolved in either acetic or nitric acid being the most often used lead salt. While the chemistry is relatively simple the rate of mixture of the solutions and other factors

determine the physical properties of the final product, so that research is constantly improving the shade, strength, and lasting qualities. Chrome green is made by combining chrome yellow and ferric ferrocyanide. Variations in shades arise from the simple expedient of changing the proportions of the two products. Another pigment is chromic oxide green (Cr_2O_3), produced by heating sodium bichromate with a reducing agent in a furnace at high temperatures. After fusion the product is washed, filter-pressed, dried, and then ground. Unfortunately, chromium oxide possesses less brilliancy and only one-fifth of the tinting strength of C.P. chrome green. Chromic oxide green is, however, more permanent; furthermore it resists alkalies and acids better than chrome green.

The father of the synthetic dye industry, Perkin, utilized the oxidizing properties of bichromate when he produced "aniline purple" in 1856. Large quantities are consumed in the preparation of important dyes and colors. Bichromates are used in the textile field as mordants for wool and to improve the fastness of colors on both wool and cotton. It also finds some application for stripping shoddy or recovered wool. The oxidizing properties are used in the production of several important fine and photographic chemicals, pharmaceuticals, essential oils, perfumes, saccharin, dye intermediates, and other synthetic organic products. Large quantities were formerly used in the manufacture of green glass for the bottle trade but a more direct process is now generally employed. In fur dyeing sodium bichromate is used as a mordant and as an oxidizing agent. It is employed in the production of aniline black on cotton fibre.

Small quantities are consumed to prevent corrosion in brine systems and to destroy objectionable wastes not readily oxidized by the air. Certain fatty oils, notably palm, are bleached with bichromate as are some waxes and resins. The process is satisfactory with oils not readily decolorized by air oxidation. Bichromates form the basis for the production of several important chrome chemicals, such as chromium acetate, chromium chloride, chromium sulfate, and chrome alum.

Chromium plating, after getting off to a poor start because of the anxiety of certain users to "beat the gun," is now firmly established.

Bichromate is produced by four manufacturers in the United States:—

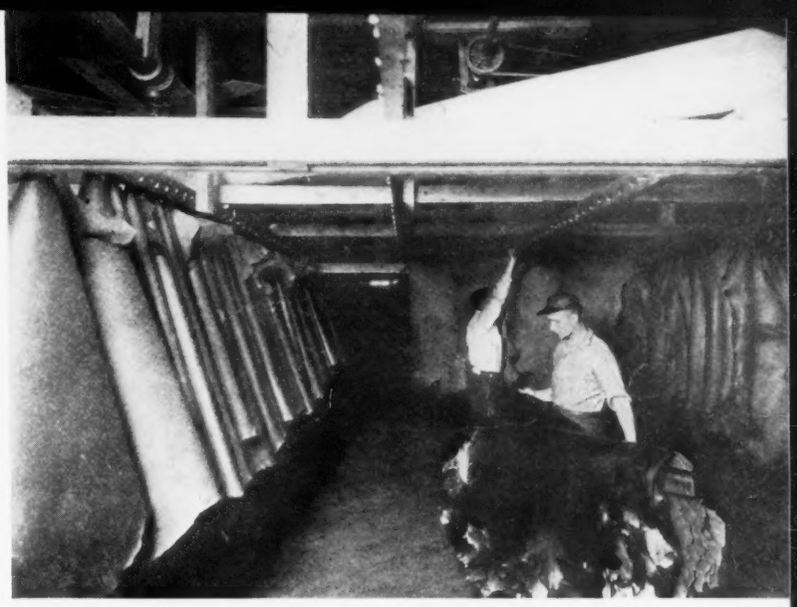
The Martin Dennis Co., 859 Summer Ave., Newark, N. J.

Mutual Chemical Co. of America, 270 Madison Ave., New York City.

Natural Products Refining Co., 902 Garfield Ave., Jersey City, N. J.

Standard Chromate Div., Diamond Alkali Co., Koppers Bldg., Pittsburgh, Pa., Prior Chemical Corp., 420 Lexington Ave., N. Y. City, exclusive sales agents.

Bichromates are usually packed in casks. Those for sodium bichromate weigh between 680 and 750 pounds. Potassium bichromate casks weigh about 800 pounds. Sodium bichromate is also supplied in barrels of about



Bichromates save time and improve products in tanneries.

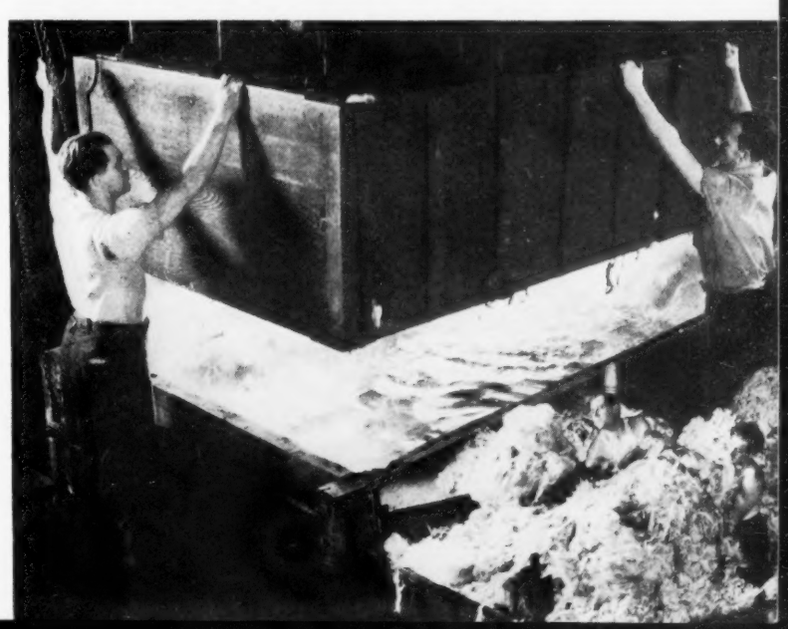
475 pounds and in the liquor form is shipped in tank cars and in a few areas in tank trucks.

Soluble chromium compounds are poisonous. In addition, unless intelligently handled, they present a serious dermatitis problem. By all means companies using chrome chemicals should consult the bichromate producers for preventive information. Valuable facts are also contained in a booklet on the subject issued by the Metropolitan Life Insurance Co.

Chrome ore enters duty free. The duty on bichromates is 1¾ cents. Imports of the latter are negligible, but American-produced bichromates are exported in large quantities to several countries of the world.

Most consumers of bichromates buy on an annual contract. A base price is established and discounts are given depending upon quantity. Prices for the past few years have been remarkably firm, but an extremely low and unprofitable price range was established in the now historic "price war" of the early '30s. Producers' costs have been rising steadily and have naturally been reflected in advancing prices. In the past few weeks the producers again established a differential on spot prices of ⅛ cent over the announced base price on contract.

Chrome treatment of raw wool is the first step in raw stock dyeing. Photographs courtesy Mutual Chemical Co. of America.



Reviewing Our Patent Law—

A discussion by chemists and attorneys of good and bad points of the McAdoo Bill which if passed would create a single Court of Patent Appeals in place of the ten Circuit Courts.

By A. E. Marshall

Past-president,
Am. Inst. of Chemical Engineers

The yearly record of applications for United States patents and of granted patents is one of continuous growth, with the exception of minor set-backs during the Civil War and the recent "Depression," and new patents are now being added to the more than 2,000,000 issued in the last hundred years at the rate of over 120 per day.

The issuance of such a large number of patents can only mean a low average standard of invention, and in recent years much thought has been given to possible revisions and reforms in practice which, converted into suitable legislation, would improve the system of granting patents without undue creation of monopoly or the discouragement of invention.

Because of the magnitude of any thorough going program of general revision of the patent system, and of the dangers inherent in too extensive surgical operations, there is quite general recognition of the need of improving by installments, and of time testing each segmental change.

Senate Bill 3823, introduced by Mr. McAdoo January 27, 1936, does not propose a general reform of the present patent structure, but is intended as remedial legislation directed specifically to a reduction in the delay and the cost of establishing the validity of an invention which exists under the present system of patent appeals.

The McAdoo Bill, in simplest terms, proposes the establishment of a "single Court of Patent Appeals" to which there shall be exclusively referred for review all issues which have arisen "wherein the jurisdiction of the district courts has been invoked upon an issue arising under the patent laws" except "cases originating in the Court of Claims, or in cases where a direct review may be had in the Supreme Court of the United States under title 28, section 345." This Appellate Court is to consist of a presiding judge and four associate judges, "each of whom shall have demonstrated special aptitude in the practice or administration of the patent law . . . ", and provision is also made for appointment by the Court of three scientific advisers to the Court "each of whom has demonstrated aptitude in scientific and technological fields" and who "shall act in an advisory capacity to said court in accordance with directions or assignments from the presiding judge."

Prior to the introduction of the McAdoo Bill, other bills which featured a Single Court of Patent Appeals have been brought before the House and Senate, but there has always been sufficient and strong opposition to them to defeat their passage.

The existence of ten Circuit Courts of Appeals, each having independent but final jurisdiction of patent matters in its circuit, necessarily brings along dissenting Court opinions on the coverage and validity of the same patent, and while diverse views of the Circuit Courts may permit the issue reaching the U. S. Supreme Court on a writ of certiorari, the development of the particular art meanwhile becomes stagnated, costs mount beyond the purse of the individual inventor or small company, so that only one pan of the scales of Blind Justice is weighted.

The specific sections of the McAdoo Bill which relate to the establishment of this Patent Appellate Court and the conferring of powers adequate to the proper exercise of its functions in patent matters not only seem desirable but they are of such importance to the chemical and allied industries, that the best efforts of scientific workers, technologists and industrialists should be concentrated on the enactment into law of those sections of the bill which will remove the present menace of diverse opinions of a multiplicity of geographic appellate courts, and substitute the opinion of a single court devoting all of its time to aiding inventors in "securing the exclusive right to their respective discoveries."

The McAdoo Bill, as it stood when the Senate adjourned, went beyond this desirable step of establishing a Single Court of Patent Appeals in that it included mandatory provisions for the appointment of "scientific advisers" to the Court.

The present system of litigating patent infringement suits, with its array of patent counsel and "experts" is an outcome of the growth of the sciences and their increasing complexity. Legal rights under common law can be fairly well determined by thorough examination of all the facts involved, but the "facts" in a patent suit cannot be as simply investigated as for instance the facts underlying a written business agreement.

The patentee in a suit for infringement, or the

respective patentees in a suit involving the construction and coverage of opposing patent claims have, as primary evidence, granted patents which have the nature of documentary contracts between the Government and themselves. Unlike ordinary contracts these monopoly agreements define the scope of the field in "claim" language which may of necessity defy translation into simple terms because to be effective the claims have to be phrased in the highly specialized terms of a branch of the arts.

The scope, unlike an ordinary agreement, is affected by all that has been previously invented or employed in the specific art and even in related arts, so the definition of the scope becomes not only a difficult matter for judicial determination, but has the added difficulty that honest differences of opinion can and do exist between conflicting patentees, their counsel and their experts.

To remove this difficulty by adding an impartial jury seems at first glance desirable and practical, but further thought will result in grave questioning of the value and soundness of the make-up of the jury proposed in the McAdoo Bill.

The U. S. Patent Office, for convenience, groups applications under more than sixty separate divisions, chemical and metallurgical applications usually falling within fourteen of these divisions. These fourteen divisions are again divided on the basis of subject matter into from four to eight "classes" for each division, so that a chemical patent application finds a place in some one of seventy-five distinct classes in the fourteen divisions.

Considering chemical and metallurgical patents only, and they comprise approximately one out of each fourteen patents issued, it would be a matter of great difficulty to select a three man jury competent to pass on all the types of inventive thought embraced in seventy-five classes. And when the duties of the jury are extended to the whole wide coverage of patented invention from "a variety of plant, capable of being asexually reproduced" to "a method for visually indicating the structure and meaning of a sentence" the three man jury might provide some aid, but the inherent dangers far outweigh the possible advantages.

A constructive idea on a jury is included in the April 1935 Report of the Science Advisory Board. Briefly, the suggestion is that jurors should be of sufficient scientific or technical qualifications so that they are expert in the field of the art to which the suit relates, that they should be selected by the Court without the necessity of securing litigants agreement to the selection, and that while initially they should be selected at large, they should, when suitable lists have been compiled by the national scientific, engineering and professional societies, be selected from such lists.

A jury selected in some such manner could advantageously be made part of the judicial mechanism of a Single Court of Patent Appeals, even possibly of the ten Circuit Courts, but legislation to this end should not be introduced until all the details of the list preparation and the exact legal functions of the jury have been completely developed.

By Carleton Ellis

President, Ellis-Foster Company

In view of the condition of patent litigation, it seems almost needless to state that an undue measure of confusion and delay results from our present system of patent litigation. Often a new and struggling industry is completely discouraged by the load of litigation costs saddled on it. In any event, the time required to establish a patent in court frequently is so great that business is left for a long period in a high degree of uncertainty. Conflicting decisions rendered by appellate courts in different circuits increase that dubiety.

For these reasons I am disposed to favor the McAdoo bill concerned with the establishment of a Court of Patent Appeals, and join in urging the establishment of a single court for patent appeals. Further, I am inclined to think that this new court, if organized, should take over the work of the Court of Customs and Patent Appeals concerned with various trade-mark and patent appeals from the Patent Office.

By Robert Ames Norton

American Cyanamid Company

The McAdoo Bill to establish a Court of Patent Appeals introduces two novelties in patent litigation. First, the appeals from the decision of the District Courts in patent cases will all be decided by a single tribunal instead of by ten different Circuit Courts of Appeals. The second innovation is to provide scientific advisers to advise the judges of the Court on technical matters involved in each appeal. The first provision marks a real advance in the simplification of patent litigation. The second provision is definitely bad.

A central Court of Patent Appeals presents a number of advantages. The first and most important improvement is that the interpretation of patents will become uniform throughout the United States.

At present, the different Circuits have built up quite divergent precedents in passing on patents. This divergence has become so serious that in many patent cases where the question of validity of the patent is a close one, the deciding factor is the place where suit is brought.

The divergence among the Circuits has also encouraged multiple suits; a patentee may sue in one Circuit and obtain a favorable or unfavorable decision and then sue in another Circuit where a different decision is often obtained. In many cases, this chaotic condition makes it impossible to determine the extent of protection available under a given patent; and thus deters industry from advancing as fast as it otherwise might.

A further advantage is that the judges become intimately acquainted with patent practice and are therefore better fitted to carry out their work than the judges in the ten Circuit Courts of Appeals, some of whom hear but few, if any, patent cases during a year.

The second provision of the Bill for scientific advisers is an attempt to adopt in the United States the practice prevalent in many European countries of providing lay scientific judges or counselors for courts deciding patent matters.

The underlying idea of giving technical assistance to the court has merit, but the method proposed in the Bill defeats this object and ties the hands of the court. Appointing three scientific advisers for life means that these will be the only men available to advise the court and with the enormous complexity of scientific and industrial development today, no three men can be experts in all of the fields which are apt to be involved in patent cases. Even if it were possible today to find three men willing to serve for the salaries provided in the Bill, whose combined scientific knowledge and experience would adequately cover all the fields of science today, they could not keep up with all of the new developments which are changing many sciences almost over night. Thus, in a few years the court would be advised on the basis of obsolete or partially-obsolete scientific ideas.

The second provision of the Bill involves using technical advisers in the place where they are least useful. Technical advice and knowledge is most needed by the District Judge because he is hearing evidence, sizing up the credibility of witnesses and is the determiner of facts in the first instance. An appellate court is a court of review, and it reviews a dead written record, deciding questions which primarily are legal rather than technical, and while technical advice is unquestionably an advantage even to an appellate court, the advantage is much less than it would be to a District Court.

If it is desired to obtain the benefit of disinterested technical advice to the court, this objective can be achieved without the disadvantages referred to above if the court were given the power to appoint one or more technical advisers for each case. This would permit the courts benefiting from the counsel of recognized experts in the field, who have been able to keep continuously in touch with the latest developments.

By Thomas Griswold, Jr.

Dow Chemical Company

A Court of Patent Appeals of some kind, e.g. that proposed in S.3823 of the last session, has been under discussion for years in response to a persistent demand and criticism of present lack of uniformity, high cost, and unreasonable delays. It is believed by the sponsors of this bill that a court set up under S.3823, or substantially similar enactment, would function to remedy defects now complained of and be a boon to industry, inventors, and the public. Such a court would relieve those judges of the present appeal courts who do not like patent cases or do not feel fully qualified to hear such cases from having to so hear and decide them. Appeals would be brought before a court, the judges of which had been selected because of their high qualifications and broad experience in patent law and patent litigation. Since a litigant would select a patent lawyer to represent him in court, just so patent lawyers would be selected to constitute the court. It is thought by proponents of the scientific adviser provision that the availability to the court of scientific advisers will improve the character and credibility of expert testimony and dignify the profession of experting. It is believed that the costs of litigation and the delays incident to the present system, at least in some circuits, would be greatly reduced. The broad jurisdiction of the court will make its decisions authoritative throughout the United States. The bill is similar to the Prindle Bill introduced some years ago, which failed of passage. Inventors, engineers, chemists, scientists, and managements of industries are urged to study this question and exert pressure, either for or against the bill, which will be opposed by the same interests no doubt as were potent in blocking the Prindle Bill.

By Nelson Littell

Hammond & Littell Company

There are too many people who would amend the patent laws on the basis of one or limited experience therewith. I think it is safe to say that 95% of the lawyers who have handled ten or more patent suits through the Circuit Courts of Appeals are opposed to the provision of a Single Court of Patent Appeals in any form in which it has now been proposed. This opposition is not based on prejudice or bias, as many industrialists assume, but on the firm conviction that any such Single Court of Patent Appeals would be a bad move for the individual clients who would come before this Court and in the long run a bad move for the patent system itself.

As proposed, this Court would hear only patent cases and, whether the Court is located in Washington or travels around the various Circuits, it would tend to become more removed from the practical problems of every-day business and more theoretical in its consideration of the questions of invention, becoming in effect another branch of the patent system, not unlike the Patent Office itself.

It is a trite saying among patent lawyers that the patent is only half the story, but what the patentee has actually accomplished in the industry in which he is working, by way of positive advance, is equally as important as the patent itself, and the more patents are considered from a theoretical standpoint, the less weight will be given to the actual accomplishments.

Hence the tendency will be to set up a fixed standard with which to judge invention and inasmuch as invention is in itself a variable quantity, one cannot apply a yardstick to it and reject all claims to patentability which fail to measure up to a given standard while allowing all claims which equal or exceed a specified standard. Therefore any tendency to standardize which is the aim of the Single Court of Patent Appeals will tend to put the patent system in a straight jacket and to deprive small inventors and the smaller corporations of rights which are now secured to them under the patent laws which would tend to inure only to the benefit of the larger corporations in any concentrated authority of a Single Court of Patent Appeals.

It is claimed that this Court would provide certainty and tend to reduce litigation but merely because a patent has been sustained in one suit, even by a Single Court of Patent Appeals, would not necessarily mean that in a second suit, brought on the same patent, the second defendant should not be permitted to bring in new evidence or to show that his structure did not infringe. In other words, if we should give universal weight to every decision of the Single Court of Patent Appeals, it would prevent all subsequent defendants from having their day in Court and their cases would be prejudged both as to validity and infringement on the mistakes or omissions of the first defendant.

Patents are litigated repeatedly because they are important and it is folly to assume that all infringers will acquiesce in the validity of a patent because it has once been sustained in a Single Court of Patent Appeals or to assume that that Single Court of Patent Appeals will reach the same conclusion when the patent comes before it a second time on different or more complete evidence as to anticipation or other grounds showing possible lack of invention.

Statistically, less than one-half of one per cent. of the patent cases decided under the present system result in conflicting decisions between the various Circuit Courts of Appeals and in the majority of the conflicting decisions which have gone to the Supreme Court, the decision of the Supreme Court has sustained the interpretation of the *second* Circuit Court to decide the issue rather than the first. Under the new system, the Single Court of Patent Appeals would be supreme unto itself and tend to perpetuate its errors, instead of permitting their correction in a second suit under the present system.

The present system of patent litigation works highly satisfactorily in over 99% of the patent suits and brings the patents before established courts with well qualified judges of proven ability. The proposed new system would be more expensive in the individual suit, would substitute a distant for a nearby court, would substitute a theoretical for a practical consideration and probably in the long run would work out a great deal more unfairly than the few instances in which the present system may work unfairly.

In considering the merits of the proposed bill, the provision with reference to technical experts should be considered separately from the provision of a Single Court of Patent Appeals. If there is a need or a demand for technical experts to advise the courts, Congress should be prevailed upon to provide each of the District Judges, on whom the burden of first deciding the validity of a patent falls, with so-called impartial technical advisers. The use of a technical adviser to the court, however, should be surrounded with proper safeguards for the individual litigants. Such technical adviser should be subject to cross-examination by either party to establish the soundness or unsoundness of his views or conclusions as to technical facts and in no instance should the technical adviser be permitted to advise the judge as to the correctness or incorrectness of any technical fact without having his opinion subject to examination by the opposing litigants and subject to criticism and objection in case the technical adviser may be wrong on his premises or conclusions.

I would welcome the use of more technical education in the handling of patent suits than is now available, providing the participation of impartial technical experts is surrounded with proper safeguards to the individual litigants as our present system of judicial administration is surrounded with safeguards, but if the technical expert is permitted to form and express his opinion off the record, where it is not open to scrutiny and criticism by the opposing litigants, then we have substituted an autocratic instead of a judicial system for the settlement of our disputes.

Industry's Bookshelf

Organic Chemistry by Lucius Junius Desha, McGraw-Hill Book Co., 330 W. 42nd st., N. Y. City, 750 pp., $3.75.

A text designed for the student who will devote only one year to the subject. An original arrangement enlists and maintains the student's interest.

Modern Chemistry by Charles E. Dull, Henry Holt & Co., 1 Park ave., N. Y. City, 745 pp. and appendix, $1.80.

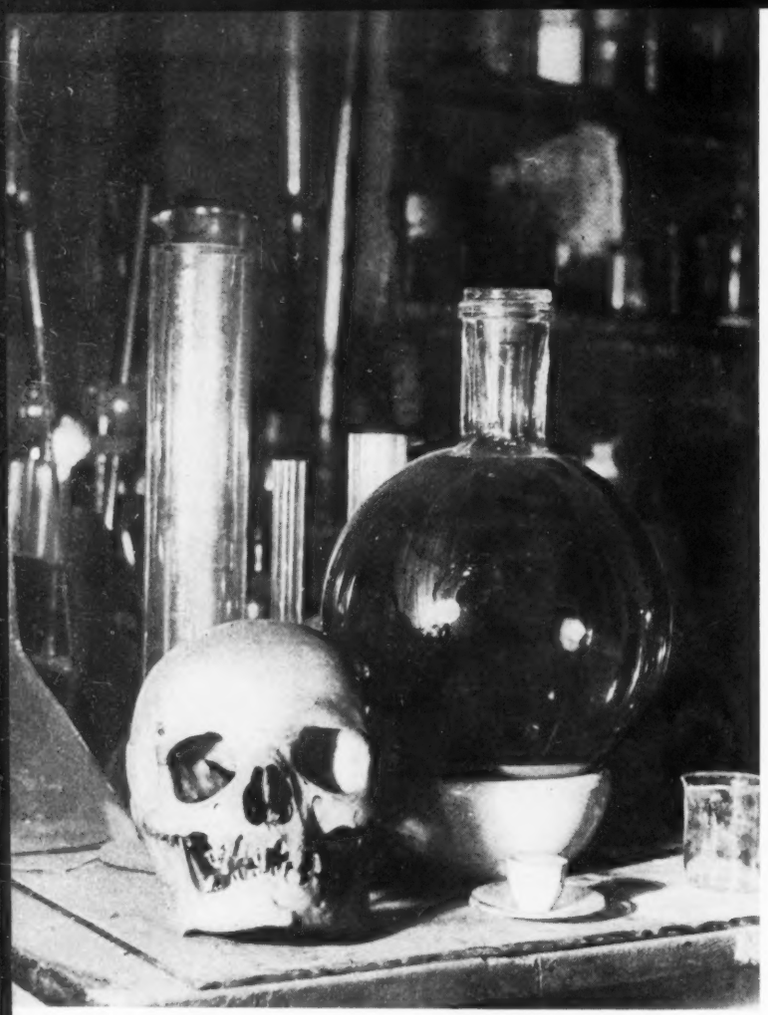
A general chemistry designed to give the student who probably will not go further a sufficient knowledge of the fundamentals so as to help him to properly understand future developments in the chemical world.

The Professional Engineer by Esther Lucille Brown, Russell Sage Foundation, N. Y. City, 86 pp., 75c.

A study of engineering education, national engineering associations, number of engineers and demand for engineers, and salaries paid engineers.

Recent Advances in Organic Chemistry by Hugh Graham, Longmans, Green & Co., 114 5th ave., N. Y. City, 519 pp., $8.50.

Present edition is made more valuable through the addition of fresh chapters on the newer developments, particularly the diterpenes and triterpenes, the problems presented by the decalins and other fused ring-systems, and the peculiar isomerism of the diphenyl derivatives.



Fifty Years of Progress

Chemical Reminiscences by

A. C. Chute

WITH sufficient gray hair one is entitled to reminisce. We all imagine that we have each lived through the most progressive half century of the world's history and that last New Year's day ended the period of greatest invention.

My oldest aunt regaled me with tales of southern Indiana when grandfather came to that country and hewed a farm out of the wilderness. Hickory and walnut and sugar maple trees were so cut down that they fell in a heap over each other and could be set on fire. The ashes gathered up, were leached in barrels and the lees boiled down in cast iron pots. The resulting potash was floated in flat boats down to New Orleans. Europe was then as dependent on America for its potash as before the war we were on Germany. Again America can produce all the potash required and now ships some across the Pacific.

By tallow candlelight my grandsire read the King James version as Lincoln read law. Food was cooked over the wood fire in a fireplace having a crane which could be swung in and out with pots and kettles on it. When kerosene was introduced for lamps and cast-iron cook stoves came down the river they thought that the end of invention had been reached. Meat was roasted on spits turned sometimes by a "chimney jack" which was the first gas turbine. Among my first memory is watching mother cook fruits and vegetables to fill tin cans which father neatly soldered up. She knew she could not can corn nor other non-acid vegetables alone, and though ignorant of pH values, she knew she could can corn with tomatoes and such mixtures containing acid fruits or vegetables. They smoked hams with hickory wood. Now the farmer buys "liquid smoke" pyroligneous acid.

My first experience in chemical engineering was when father brought home a new gasoline stove. The old ones were common in every summer kitchen, but the great feature of this was that the gasoline tank was on a swivel so it might be lowered to a horizontal position and filled without danger of blowing up. I was so excited about this I climbed through a hole in the fence to the neighbor who was ironing with the old style gasoline stove and she came over to see this great technical improvement in the petroleum industry. I was then less than five years old, but my father was connected with the gas company so I was up on chemical engineering as applied to heating and lighting. A few years later I lived with my aunt in the country and with my cousin a few years older tinkered with the Tirrell Gas Machine (see N. Y. Phone Directory) which was located a few hundred feet from the house and succeeded in getting it to work. We lit the parlor with this appliance which had been long neglected.

These infantile adventures in chemical engineering show that, contrary to many published statements, gasoline was largely used in the last century and was not entirely a waste product. The younger generation do not realize how much of our present technology in the petroleum industry was foreshadowed by good work projected too soon.

Old Dr. Chandler loved to tell how, shortly after Drake had sunk his first well (the waterboy died last summer putting this in a past generation) it occurred to some one to send a few barrels to the Pratt Astral Oil Co. then (and now) in Long Island City, who were making "coal oil" from English cannel coal. They noted that this new oil from Pennsylvania resembled their crude distillate and added some to a still charge. Much to their surprise it made better oil than the coal. They promptly abandoned coal and used petroleum ever afterwards. These people had the technique of coal and oil refining in using the acid and alkali wash and in distilling. This illustrates the advantage of

having different industries to work on new problems. In those early days the Penn Salt Co. had a works near Oil City and furnished the oil refineries with acid. Their young chemist, H. H. Rogers, became interested and invented and patented the kettle and column still for distilling oil. His column had all the good features of the old Derosne column and the modern bubble tower. The Penn Salt Co. would not have a man who fooled with such wild schemes so H. H. Rogers was forced to look for a new job. The Rogers fortune repaid him for being progressive. This patent is so early that few know of it. It anticipates most of the "bubble towers," etc., now used in refining; but he lived too soon to have his invention fully appreciated.

At a very early day cracking was known. The yarn about the still man who left his still and came back and found "cracked oil" suitable for kerosene running out, is well known. This cracked to gasoline also, but they did not want gasoline then and disregarded it. Boverton Redwood first showed that cracking under pressure was better and pressure is always so used nowadays for making gasoline. It also makes cracked kerosene, but now we ignore that. It was only in early post war years that cracking for gasoline was needed and the first large scale plant was put up by Burton at the "S.O." of Indiana works where pressure was put on stills much like the ordinary shell stills but made stronger. This great improvement had been used in the whiskey and spirit business for nearly a century.

Soon after my first visit to the wood distillation plants I visited the grain alcohol makers in Chicago and found that the problems of fractional distillation had been solved about a century ago by the invention of the Coffey still in England, or "beer still" as we call it, and in France the Derosne, or "bubble cap" rectifying still, and the "Savalle," or perforated plate still, were so perfected that little improvement has been made since. They were first adopted by the grain alcohol industry, then the benzol industry, and I introduced them to the wood alcohol work. Finally the petroleum industry has built them on a grand scale. Quite recently it has been proposed to distill alcohol under high steam pressure and "re-use vapors" which are condensed in a calandria on another column which rectifies the condensed distillate. The old "beer heater" always "reused vapors" in heating the beer feed and there is no advantage in pressure distillation when the distillate can be condensed without pressure. There is a large loss of heat in the slop when discharged under pressure and exhaust steam cannot be used. The only improvement made in distillation is in having other industries adopt the old and tried methods and apparatus, (trans. Br. Inst. of Chem. Eng., V.13 ('35) 57).

Thus one industry highly develops a unit process and uses it many years before it is adopted by another industry that has a similar problem. Cracking oils for gas is very old. Such cracked gas was used in Paris before the streets were piped. The gas was of course highly compressed. The Pintch gas used for lighting railway cars in the last century was made from oil, cracked to produce the maximum amount of compressible gas that would not liquefy, while the old Blau Gas was liquefied in cylinders. Both these processes used vapor phase cracking.

The Eighth Congress of Applied Chemistry in New York 1912 developed that synthetic rubber was being made in Germany and in England. Duisberg stated the Kaiser had an automobile with tires of synthetic rubber. Perkins stated that the English were fermenting to butyl alcohol to make butadiene from which they made rubber. Both had bad dreams of the same great vision. It inspired McElroy and Mercereau to engage in cracking lubricating oils to produce di-olefines and a patent was issued on chlorhydrin. One result was that when the Germans first threw mustard gas the only barrel of ethylene chlorhydrin in the world outside of the Central European Powers was in Long Island City. This patent passed to the Carbide & Carbon Chemicals Corp. and now much "Prestone" is made through chlorhydrin from ethlyene produced by the "Gyro" process which is a vapor phase cracking process.

Hall had an experiment plant near New York and an office in the Chemist's Club before the war and took out many patents on vapor phase cracking of petroleum oils. He went to England during the war and made benzol and toluol. His pupil DeFlores followed up his work and has several plants now working on the vapor phase process. Modern cracking has reached such temperatures and pressures that it is questionable whether it is not all to a considerable extent in the vapor phase. The repercussions of oil distilling technique upon power producing have stimulated great improvements in furnaces and boilers. The Burton stills built to stand two hundred pounds of steam would not hold oil under one hundred pounds. So the boiler makers made better oil stills and this encouraged the power man to use higher steam pressures.

Most modern boilers in the recent Power Show were pipes and tubes, some radiant and some convection coils. They closely approach the pipe furnaces of the modern oil refinery. Perhaps these furnaces and boilers will soon be used interchangeably, to mutual advantage. One of the most exploited exhibits was the "steam-mobile" described by the mechanical engineers as more economical than the Diesel which it was hoped to supplant. The drawings showed a coil of pipe with an oil burner projecting downward as do the nozzles of the pulverized coal boilers. The flame passes up through more coils and to recuperators and air heaters as found in most modern boilers. The Langley airplane, now in the Smithsonian as the first that ever flew under its own power, contained a flash steam boiler as did the White, Stanley and other "steamers" of early auto days. This "steam-mobile" seems to have the same construction. But it would take a three-story house to hold it. Exhibited there was the "Dowtherm" boiler. This, with the mercury and other boilers using

liquids of high boiling point indicate chemicals as perhaps revolutionizing the steam power plants. Heating by highly heated liquid oil has been practiced for many years, but power plants heating by oil vapors at high temperatures open a new field for the chemical engineer in searching for the best liquid medium which can be heated the highest without decomposition and at low pressures.

As a small boy I visited the Centennial Exposition at Philadelphia in 1876 and saw the Corliss engine, the greatest of its day. It is still unsurpassed in steam economy within the range of its steam limits. Ford is reconstructing the old Corliss for his museum and says they are still good for use of steam without vacuum. The economy of the turbine is on the vacuum side. When exhaust steam is used for multiple effect evaporation this combination of the thermodynamic effect of high pressure steam and the utilization of the latent heat in evaporation is the most economical.

In an early issue of the Franklin Institute Journal I have read a proposal for an internal combustion engine which was quite practical. It ended with the statement that "spirits of turpentine might be used as the oil" and it dawned on me that the gasoline engine had been invented before the age of petroleum. I saw the Otto gas engine at work on Washington city gas as early as 1880 and realized that, like the Tirrel gas machine of our youth, it could be run on gasoline. Its universal use for motor transport could not have been foreseen, as any engineer in 1896 could prove by the laws of mechanics that the internal combustion engine was impractical for motor use. But the great invention of the clutch (Selden patents) solved the problem of running the engine while the car was standing still! With the predicted famine in oil we will go back to the electric vehicle and we will drive up to the filling station and order a new battery. Will we get the juice from T. V. A. or Quoddy?

The Farm Chemurgic in its desire to give back to the farmer the production of horse power expects to make alcohol into auto fuel. Germany has long tried to promote the use of alcohol for fuel and back in 1906 had a large exhibit of apparatus in New York when we introduced denatured alcohol. Recently she has had to prohibit its use. For when they made "kartoffel spirit" they had no "kartoffel salad" to eat and they are pretty hungry. With corn at $1.00 per bushel alcohol fuel costs 40c per gallon and gas sells for six and one half cents in tank steamers, F. O. B. New York harbor.

My first metallurgical work was done more than fifty years ago when it took five men to make the same amount of steel that now one makes Rails sold then at $30 per ton. Now they sell for at least 20% more.

Dendro-chemist extraordinary, arbiter of the Chemists' Club Round Table, chemist, engineer, inventor, keen critic, and outspoken analyst, the writer of these reminiscences is one of the conspicuous personalities of the chemical profession. They are written out of an experience that reaches from the forests of British Columbia to the mines of Mexico and a practical working knowledge of almost every branch of the industrial activities of American chemistry.

At Baltimore, at the recent Chemical Engineers' gathering, we all saw one of our greatest steel works. Yet I saw nothing better than we had when I began—only bigger. We have made practically no improvements in the metallurgy of iron and steel since we introduced the German and English blast furnaces including the English Bessemer converter. Perhaps we, or the Canadians, invented the hot blast. We did invent the noted "niper," the use of the bell bottom skip or hoist for filling the furnace. This was invented about 60 years ago by Burt (son of inventor of typewriter recently exploited at patent centennial). In the early days we had steam boilers and blowing tubs and regenerative stoves for burning the waste gases from the furnace. The stoves heated the air blast furnished by the blowing tubs and no other fuel was used, making the blast furnace self contained. Now they are using diesel engines with blowing tubs directly connected and also with dynamos attached. This requires elaborate washing of the gas to remove dust! They also use at same furnaces, boilers and engines with dynamos directly connected to centrifugal fans. No one seems to have made up his mind whether any, or all, of these improvements is the best. In any case Ford's very modern plant has no surplus gas or power from the furnace gases. The converters and open hearths have not changed for fifty years except to get bigger and more cumbrous.

I remember the arc lights in Washington giving way to the carbon filaments. This seemed to be the acme of perfection. Thirty years ago I saw the tantalum filament which soon gave way to the tungsten lamp. When my professor of chemistry showed us the Crooks tubes lit up we recognized that the vapor-filled tube would be the best for light. We had to wait long for the glaring neon tube. In the meantime the Peter Cooper Hewitt mercury lamp, the Moore light filled with CO_2, came and went. Now we have the sodium light, the ultra violet light, and many others. The chemist has contributed the gases. He has improved the glass and has helped in all improvements subsequent to the "lime light."

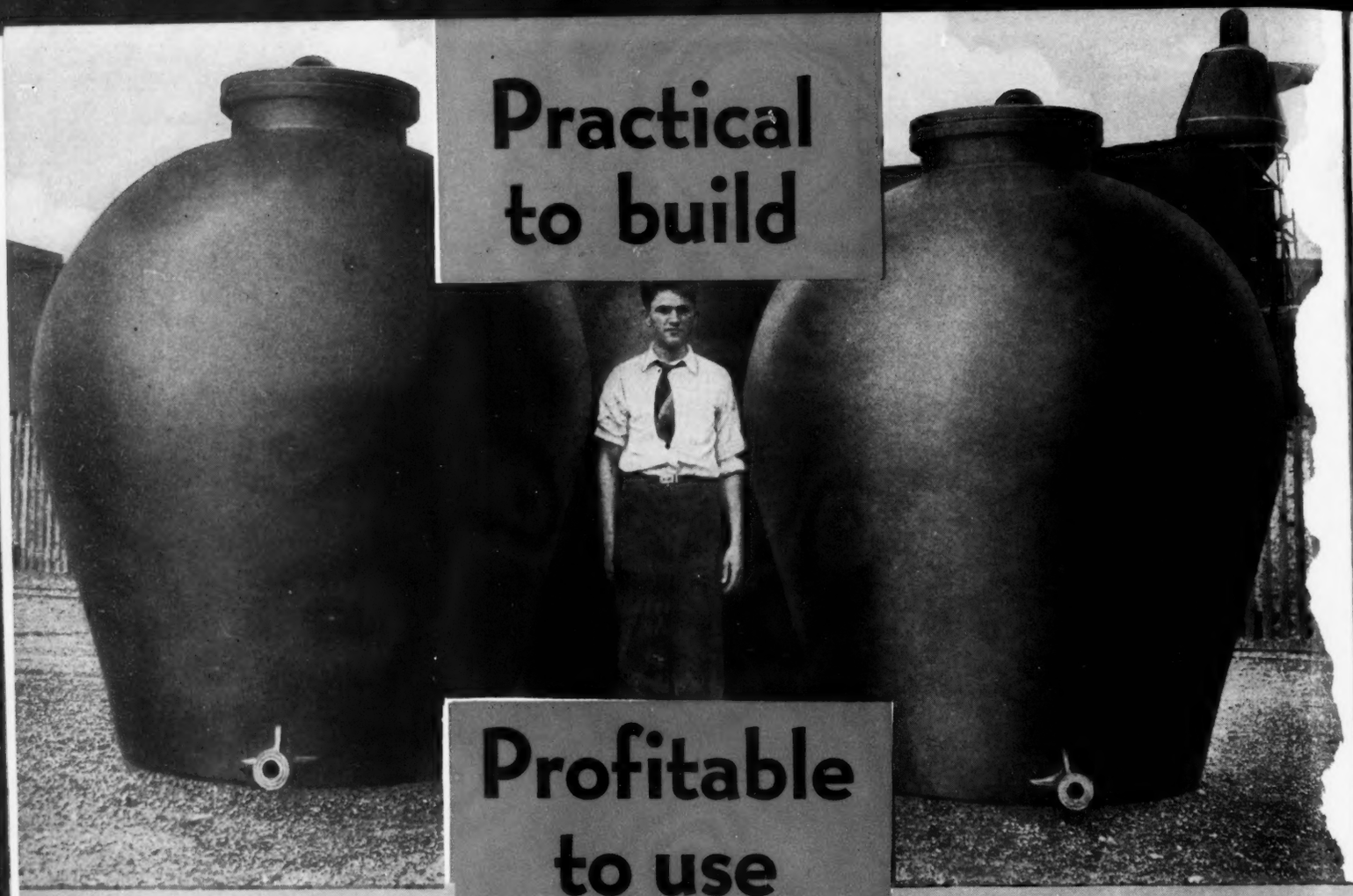
When small I rode on Pullman cars which have changed less than anything else in America. Kettering has said their only improvement in 50 years is the slits through which used razor blades could be dropped.

Much we call progress is at best mere readaptation of old principles of chemistry and engineering to new problems. At worst it is only a crab-like movement in a new direction rather than steps forward.

Plant Operation and Administration

A huge slab of alum photographed in Chattanooga, Tennessee plant of American Cyanamid and Chemical Corp.

A Digest of New Methods and Equipment for Chemical Makers



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Conversion of Coal Into Liquid Fuels by the Fischer Process

By Dr. Franz Fischer*

THE first reliable data concerning the formation of hydrocarbons from carbon monoxide and hydrogen are contained in the 1913 patents of Badische Anilin und Sodafabrik. When, according to these patents, catalysts are used at about 400° C. and 100 atmospheres (1,420 lb. per sq. in.) and more, hydrocarbons and their oxygen derivatives of a wide range of boiling points are obtained.

In 1922-23 Tropsch and I found that in the presence of an alkaline iron catalyst at 400° C. and 100 atmospheres oxygenated compounds are produced, which consist of alcohols, aldehydes, ketones and fatty acids. The mixture of these was called "Synthol."

In conjunction with Zerbe, I found that as the pressure falls, but under otherwise similar conditions, compounds containing less and less oxygen are formed. At 7 atmospheres (99.4 lb. per. sq. in.) an oil is obtained which consists principally of paraffinoid hydrocarbons.

This discovery pointed to the fact that the synthesis of pure hydrocarbons from carbon monoxide and hydrogen must be carried out without application of pressure. It now became necessary to develop catalysts which at atmospheric pressure possessed sufficient activity to counteract the reduced rate of reaction.

Synthesis of "Kogasin"

In 1925 Tropsch and myself were able to record the first success at atmospheric pressure. It became evident that to ensure that the already highly active catalyst maintained a fairly long life it was necessary to work at low temperatures, namely, between 200 and 300° C. instead of 400° C. This reduction in temperature slowed down reaction velocity still further, which again had to be counteracted by an additional increase in the activity of the catalyst. It took another six years before my other collaborators, particularly Herbert Koch and Karl Meyer, and I produced catalysts which, while possessing a sufficiently high reaction velocity below 200° C. without the application of pressure, remained active for several months.

Purification of the Process Gases

At a pilot plant at the Institute two further problems important to the petrol synthesis received attention. In the first place, it was necessary to purify the water gas, or the final mixture of gases ($CO + 2H_2$) as required for the synthesis, sufficiently from organic sulfur compounds to ensure a long life for the catalyst—the sulfur content of the gas must not exceed 0.2 gram of sulfur per 100 cub. m. (0.087 grains per 100 cub. ft.). After much painstaking research, my collaborator Roelen developed a satisfactory cheap process which meets the conditions imposed by the hydrocarbon synthesis.

The Reaction Chamber

The other problem to be solved arose when we translated laboratory results to a plant of 2,500 times the size. While the water gas process, using, for instance, coke and steam, is strongly endothermic—that is to say, consumes energy (heat) in the production of hydrogen and carbon monoxide—the formation of aliphatic hydrocarbons, as, for instance, "gasol," petrol, diesel oil, paraffin waxes, is exothermic—that is to say, liberates energy When conversion is complete, the heat of formation amounts to no less than 20% of the potential heat of the gas, corresponding to about 600 calories per cub. m. (67.3 B.Th.U.s per cub. ft.). This amount of heat is sufficient to raise the temperature of the gases several hundred degrees Centigrade, whereas the synthesis demands 190° C. as the optimum temperature, and permits very little variation. Roelen and myself designed many types of reaction chambers in which dispersion of the heat of reaction was attempted in various ways. A number of designs have been published but not the final construction, which was handed over to the Ruhrchemie A.G.

As far as the manufacture of process gases is concerned, it is essential that they have a higher hydrogen content than ordinary water gas. Such gases can be produced by several old and new processes which use coal, semi-coke or high-temperature coke as raw material. I should like to mention only one process, namely, the one developed by my collaborator Pichler and myself, for use on both the small and large scale. It produces direct a gas containing carbon monoxide and hydrogen in the ratio of 1 $CO : 2H_2$ at a minimum consumption of coke. It has been designed with a view to establishing the process of coking plants and differs from the ordinary water gas process in that during the gas-making period, instead of steam alone, a mixture of steam and coal gas is admitted to the generator. The methane of the coal gas being converted into carbon monoxide and hydrogen in the ratio of 1 : 3 raises, together with the hydrogen already contained in the coal gas, the hydrogen content of the water gas, so as to produce the desired ratio of 1 $CO : 2H_2$.

Operation of the Process

The operation of the process consists of:—

(1) Production of water gas or mixture of gases;

(2) Preliminary purification from dust;

(3) Purification from hydrogen sulfide;

(4) Final purification from organic sulfur compounds down to 0.2 gram per 100 cub. m.;

(5) Passage of gas through the reaction chamber;

(6) Condensation of water and oil;

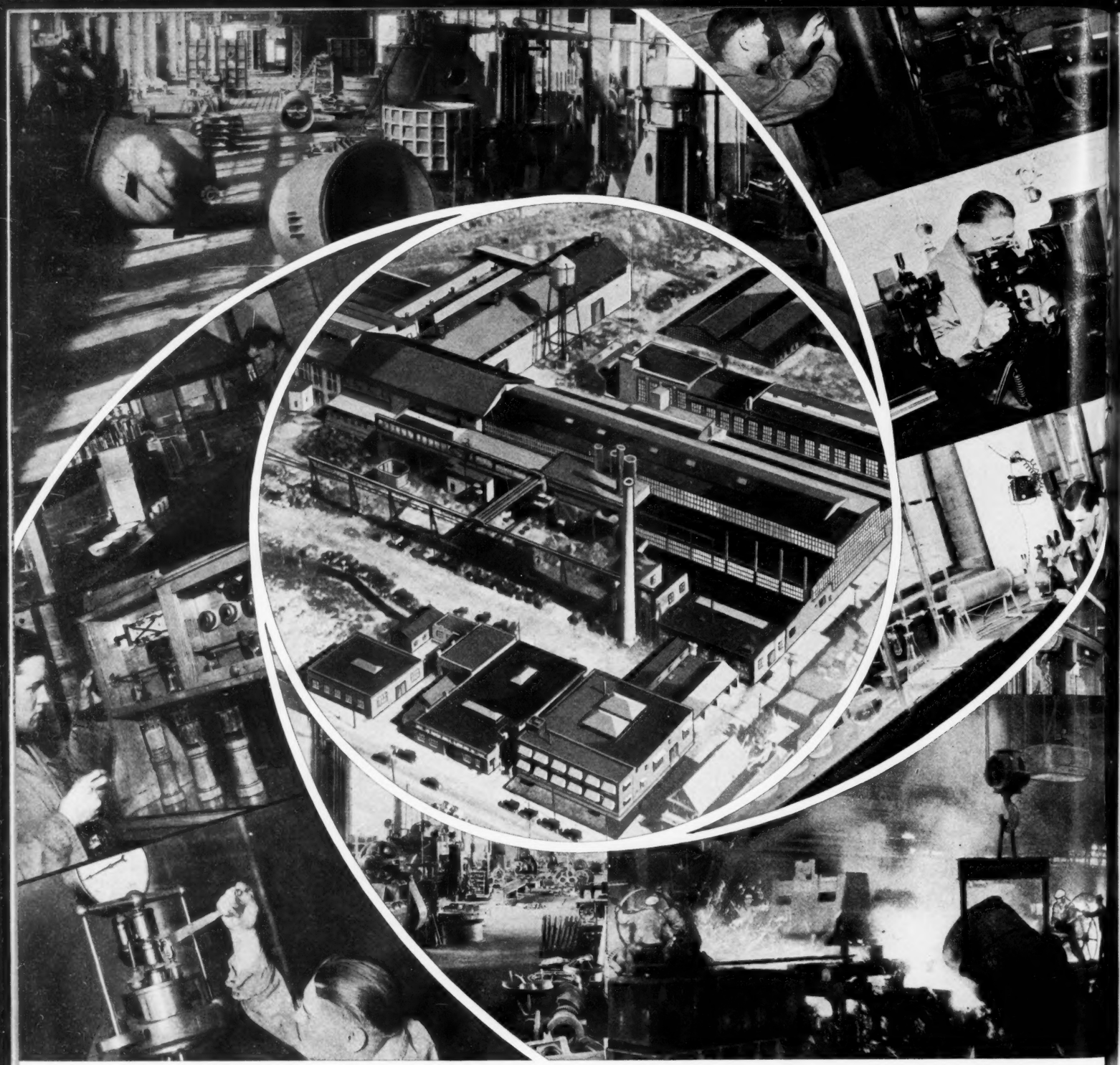
(7) Recovery of petrol and "gasol" from residual gas by means of active carbon.

In the present process the reacting gases pass over the catalyst only once. This simple procedure has been possible because equilibrium in the formation of aliphatic hydrocarbons from carbon monoxide and hydrogen at about 200° C. shows a predominant tendency towards hydrocarbons. Under these conditions the process yield amounts to 110 to 120 grams of hydrocarbons per cub. m. of gas (6.8 to 7.5 lb. per 1,000 cub. ft.), consisting of "gasol," petrol, diesel oil, and paraffin waxes.

It is possible to increase this yield almost to the theoretical, but the process becomes more complicated. The relative quantities of "gasol," petrol, diesel oil, and paraffin waxes are, for instance, as follows, in per cent. by weight: "gasol" 8, petrol (boiling up to 200° C.) 62, diesel oil 24, paraffin wax 2, ceresin 4.

Relative yields of the individual constituents can be varied by altering the operating conditions. Petrol, however, is at present the principal product. The gasol is recovered from the residual gas, the paraffin wax from the oil, while the ceresin, which has a melting point of over 80° C., is extracted from the catalyst. By suitable treatment the raw product can be split up into synthetic ceresins of melting points ranging from 100° to 120° C. which are unique in character.

* Summary of the Melchett Lecture delivered recently before the Institute of Fuel, London, Digested from *The Petroleum Times*, Nov. 14th, p613. Dr. Fischer is a member of the Kaiser Wilhelm Institute.



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All products possess a high degree of purity and a pleasant odor, are colorless and entirely free from sulfur, so that they require no further treatment, except a wash with alkali in order to remove traces (a few tenths of 1%) of fatty acids. From the point of view of motor fuels, the properties of petrol and diesel oils are interesting.

Boiling-point curve of the petrol is quite smooth. Petrol and diesel oil, like the other products, consist mainly of aliphatic hydrocarbons, in which the carbon atoms form a straight chain. This is an advantage for diesel oils, but not desirable in the case of petrol, as the higher boiling constituents possess no anti-knock properties. Since the petrol motor uses the lower boiling fractions, whereas the diesel motor runs on those of higher boiling point, it is only necessary to improve the anti-knock properties of the lower boiling fractions. This can be achieved by the addition of alcohol, benzol, or benzol and alcohol. The addition of 0.5 ml. of tetraethyl-lead per liter—that is to say, 0.05% by volume—raises the octane number sufficiently.

Motor spirit can be treated without additions by "reforming" by which their content of aromatic hydrocarbons is increased. There are many other methods, for instance, "isomerization" seems promising.

The time will come, however, when processes for the improvement of the anti-knock value of petrol will be superfluous. Great strides have been made in design of Diesel and other internal-combustion engines which require not anti-knock properties, but rather good spontaneous ignition properties.

The higher boiling fractions (up to about 300° C.) are on account of their chemical constitution the best type of fuel for Diesel engines, particularly high-speed engines. The calorific value is approximately 10,470 calories per kg. (18,846 B.Th.U.s per lb.) and consumption per h.p. hour is less than 190 grams (0.42 lb.). Our diesel oil "Kogasin II" possesses excellent combustion properties, gives a clean exhaust even in the case of overload, and causes no knocking, which usually occurs in Diesel engines, being ascribed to delayed ignition. With regard to the low-temperature properties of our petrol, "Kogasin I" and diesel oil "Kogasin II," it has been found that the solidifying point of the former is below —60° C. and that the solidifying point of the diesel oil, from which the paraffin wax is removed by freezing out, is below —30° C.

Lubricating Oils

The task we set ourselves was the production of motor fuels from coke or coal by means of carbon monoxide, but the solution of the problem would have been incomplete if Herbert Koch and myself had not found a material in "Kogasin" which can be converted into lubricating oils. The material is the mono-olefines contained in "Kogasin." Conversion of these olefines into lubricating oils can be effected, for instance, by the addition of a few per cent. of aluminium chloride.

It is beyond the scope of this address to detail the operating conditions which affect the olefine content of "Kogasin," and it must suffice to say that it can be varied quite considerably. Examination of the individual fractions of "Kogasin" reveals that their olefine content increases with a fall in the boiling point of the fractions. The oils, which have been produced by the polymerization of the olefines contained in individual fractions, possess extraordinary characteristics, inasmuch as in spite of their uniformly low specific gravity of 0.83 to 0.85, certain fractions yield lubricating oils which show a very small change of viscosity under the effect of temperature, a most desirable feature.

The following table contains a comparison between a well-known mineral motor oil (winter grade) and the corresponding "Kogasin" lubricating oil. It also gives information with regard to "Kogasin" aircraft motor oil, produced by removing certain less viscous constituents of "Kogasin" lubricating oil by vacuum distillation.

	"Quality" Automobile Oil (winter grade)	"Kogasin" Lubricating Oil (winter grade)	"Kogasin" Aircraft Oil
Specific gravity at 20° C. ...	0.882	0.839	0.855
Viscosity (degree Engler):			
At 20° C.	32.6	32.0	125.9
At 50° C.	6.29	6.29	18.7
Viscosity index	81	84	98
Solidifying point °C.	—16	—42	—30
Flash point °C.	220	205	282

Comparison shows that "Kogasin" lubricating oils are of first-class quality, particularly with regard to their solidifying point.

Dusts, Fumes, and Gases Defined

By Philip Drinker

Confusion exists as to the distinction between dusts, fumes, vapors, mists, and gases, with the result that respiratory equipment for protection against them occasionally is wrongly applied. Respirator manufacturers have many examples of such misunderstandings and often are blamed for errors which result solely from confusion in nomenclature.

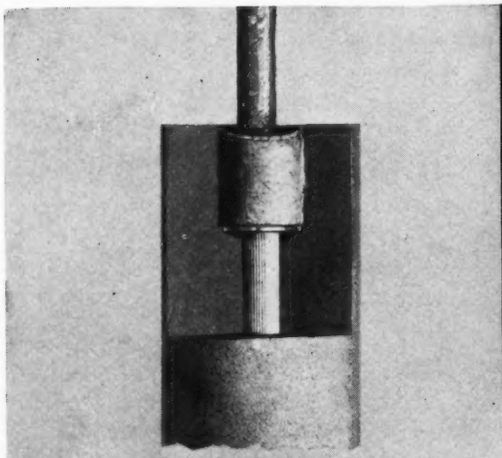
Dusts include all types of dry earthy particles small enough to be blown about by ordinary air currents. Dust suspensions may be generated as the result of a grinding, blasting, or comminuting process; or they may result from the handling of finely divided materials as in mixing processes, in sweeping, or the blowing about of wood flour, plant pollens, or common road dust. There is no chemical limitation implied by the term "dust" while the range in size of dust particles extends from the sub-microscopic to small sand grains. Such materials can be caught very effectively by the modern type of dust respirator.

Fumes embrace two definite kinds of atmospheric suspensions. It is unfortunate that such double-naming exists in the trade but one had best admit the fact. Thus, "lead fume" is a very old term used to describe the visible dark grey suspension which evolves from lead heated to high temperatures. The material in such suspensions is mostly tiny particles of lead (and lead oxide), much smaller in size than those of the average dust, with some lead in the gaseous state. When such a mixture is cooled down to the point where it can be breathed the contaminant is then the lead particles alone without any gaseous lead.

The word "fume" is also used to describe the mixture of gas and mist which may come from a bath of hot nitric acid, for example. None of the material in the suspension is dry—it is all in the form of a true mist (liquid droplets) or as a gas, yet it may have a thick brownish color. One buys fuming sulfuric acid (a liquid) from any chemical supply house and one can see large plants for recovering lead fume—a dry powder. Obviously, one does not want the same kind of respiratory equipment for two such different substances yet the customer often asks for a respirator to protect against fumes.

Lead fume happens to be very difficult to filter out so that the ordinary respirator which catches dust particles may be inadequate against lead fume. The acid fumes, containing both liquid particles and gas, require a filter to catch the droplets and a gas absorbent to catch the gaseous constituent. Therefore, it usually happens that the respirator manufacturer, in self protection, advises the customer to use an air-supplied or air-line respirator because he will then be adequately protected whether the fume is of solid particles, like lead, or a liquid and gas mixture. If the customer stated exactly what the suspension consisted of or told how it was generated he might be able to use less expensive equipment.

A *vapor* is a gas which can be converted into a liquid at ordinary temperatures and pressures. Thus, water vapor is a common constituent of the air and is contained in concentrations



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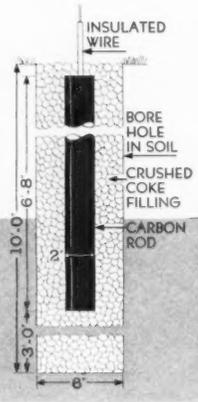

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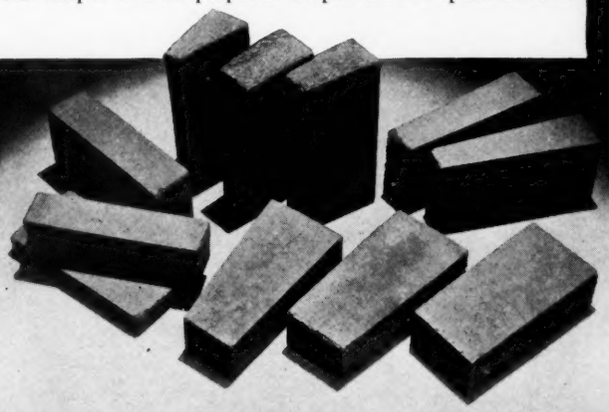

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which vary with atmospheric conditions. Respiratory protective equipment is used against low concentrations of a great many vapors arising from common organic solvents such as benzol. Many such substances are absorbed by activated charcoal as in gas masks. There is a small cartridge type respirator in which the cartridge is filled with activated charcoal for absorbing a vapor such as benzol or with soda-lime for absorbing an acid gas such as carbon dioxide. Because these small cartridges contain comparatively little of the absorbent their use is limited to very low concentrations. They should not be used for emergency rescue work.

A *mist* consists of a suspension of liquid droplets together with the gas from which the droplets condensed. The commonest example is atmospheric fog. Droplets of mist are necessarily microscopic in size or they would not remain in suspension. As soon as several droplets collide and form a large drop the liquid settles out. Therefore, it is possible to dispel a true mist very readily by simply stirring up the air—ventilation or dilution is unnecessary.

Mist droplets can be filtered out by ordinary dust respirators —that is, the visible portion of a fog is easily removed by filtration—but the gaseous constituent may pass through the filter. If the mist happens to be corrosive to fabrics the resultant effect upon a dust respirator is bad. Paint spraying generates a mist and a certain amount of vapor. Protection usually consists of an air-line respirator but it is not at all uncommon to use cartridge respirators containing activated charcoal and a filter.

A gas contains no solid or liquid particles under ordinary atmospheric conditions. The filter units of any of the common makes of respirators are ineffective against gases. Respiratory protective equipment which catches gases always consists in some chemical agent which either absorbs the gas or converts it into some other substance which can be absorbed. Because one can rarely be sure of the gas concentration to be encountered it is common practice in exploring man holes, for instance, to use devices supplied with air or oxygen in order that the wearer may be safe, regardless of the conditions he finds. The gas mask, however, and its outgrowth, the chemical cartridge respirator have a definite place in industry and are in wide use today.

The U. S. Bureau of Mines has helped in the manufacture and use of respiratory protective equipment greatly by its issuance of specifications for permissible equipment. Their present schedules do not include the air-supplied respirators such as those used in paint spraying or sand blasting but both the Bureau and the American Standards Association will issue such specifications presently. Address before the Chemical Section, National Safety Council's Atlantic City Meeting.

An Improved Process of Nitration

One modified type of a process of nitration that has recently been proposed is the subject of E.P. 455,570 of 1936 that has been granted recently to G. Meissner, of Burbach, Germany. The specification claims a continuous process whereby nitration of aromatic hydrocarbons is effected by subjecting the nitration mixture (consisting of nitrating acid and aromatic hydrocarbons) to a positive circulation through a cooler built into the nitrating vessel and by carrying out the nitration in such a way that first of all the aromatic hydrocarbons are preliminarily nitrated by weakened acid in the upper part of the nitrating vessel, and the nitration is completed by strong nitrating acid supplied to the lower portion of the apparatus.

According to a further feature of the invention, air in large quantities is emulsified into the nitrating mixture, while the latter is in the nitrating vessel, by means of a suitable agitating device, whereby the nitrating process is carried out in a rapid and uniform manner.

In a drawing accompanying the specification, a nitrating vessel having a system of vertical cooling pipes, surrounded by a cooling medium and an agitating device, is shown. At its lower end the agitating device carries a screw mixer, and above this mixer inclined vanes which serve to emulsify air in finely-divided condition into the reaction mixture. The screw mixer simultaneously serves to effect a satisfactory stirring and to forward the reaction products. The mixer draws the reaction mixture down through the reaction zone, thereupon driving it up again through the system of cooling pipes, thereby achieving a continuous circulation of the mixture.

The cover of the vessel consists of a glass plate mounted on a suitable flange or bracket in the upper part of the vessel. The stem of the agitating device passes through an opening in the cover plate with a loose fit, whereby air can pass from the outside of the vessel through the annular space between the stem of the agitator and the glass plate into the interior of the vessel.

In operation, the aromatic hydrocarbon is fed into the nitrating acid, and in process, as the nitrated mixture is discharged, fresh hydrocarbon is fed into the top of the apparatus and fresh acid to the bottom.

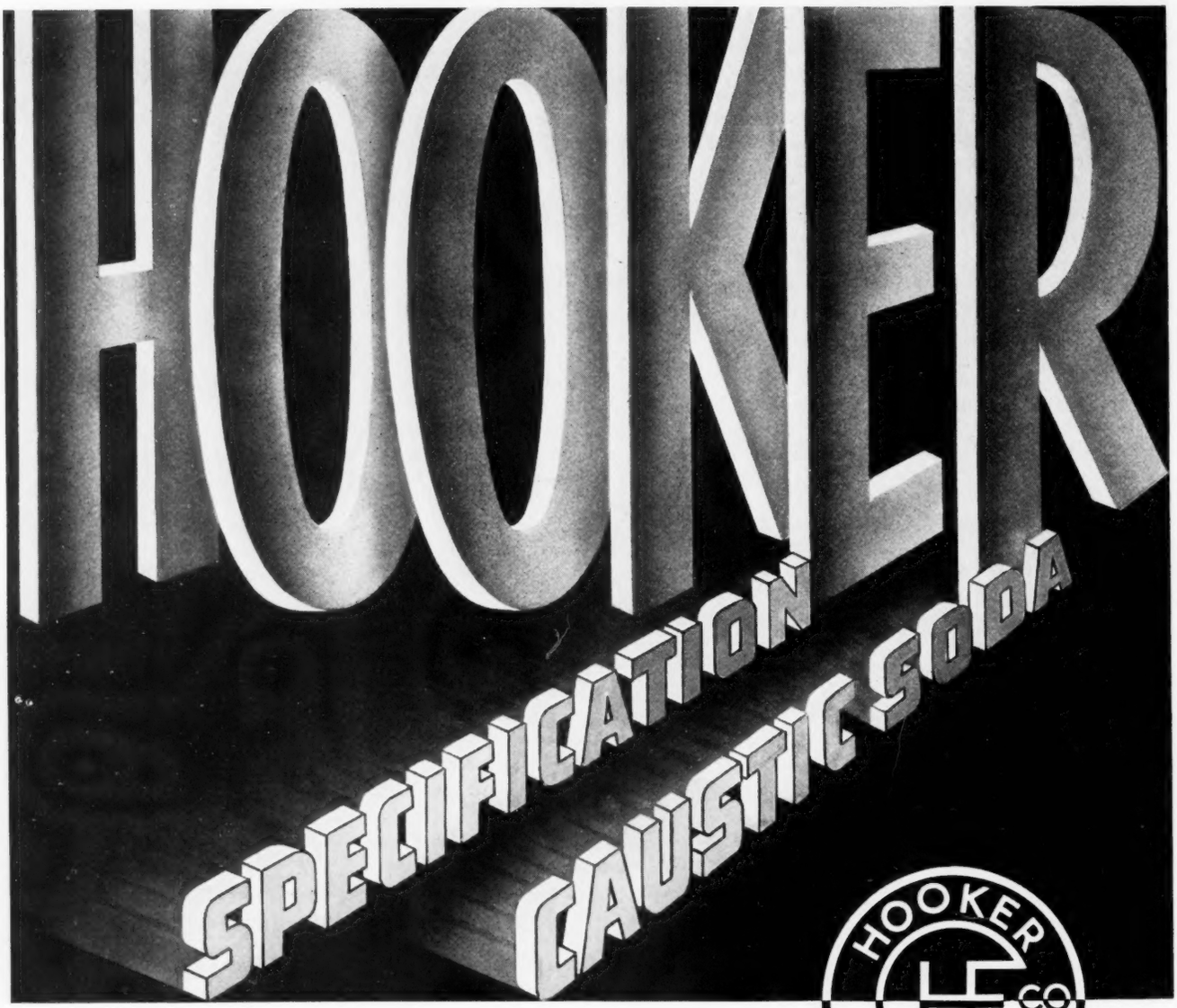
The advantages claimed for the process are many. The emulsification of the air with the nitrating mixture is stated to result in the practically complete obviation of the formation of oxides of nitrogen, and also to facilitate the separation, when desired, of the nitro compound from the spent acid. The arrangement is also claimed to be such that the speed of heat removal from the reacting mass is very high, so that the size of plant can be reduced for any given output, compared with existing plant, or for equal sizes of plant nitration is completed more speedily by the new process. The specification refers to the nitration of toluol, but there is no indication given as to the stage of nitration that may be obtained, though the reference to the readiness of separation of the nitrated mixture makes it appear that mononitration only is aimed at. British, *The Chemical Trade Journal,* Nov. 27, p452.

Caustic and Sulfuric Acid From Sulfate by Electrolysis

Interest has been shown in the possibility of the development of a technically and economically efficient method of producing caustic soda and sulfuric acid by the electrolysis of aqueous solutions of sodium sulfate. It is believed that in Germany and Russia the process has been elaborated to the pilot-plant stage, but whether a full-scale installation is yet in operation is not known. Direction which research on the subject is taking, however, is indicated in E.P. 455,429 of 1936 that has been recently granted to the I.G.

In the electrolysis of aqueous solutions of alkali metal sulfates by the amalgam process, states the specification, it is necessary to provide a diaphragm in order to prevent the sulfuric acid liberated at the anode from reaching the mercury cathode. With a view to keeping the bath voltage as low as possible, it is desirable that the distance between the electrodes, and consequently also the distance of the diaphragm from the surface of the mercury cathode, should be reduced as far as possible. At the same time, however, the diaphragm must be prevented from coming into contact with the mercury.

When constructing ordinary cells having horizontal electrodes, in which the mercury cathode is disposed at the bottom of the cell, great difficulties have been encountered in finding a suitable diaphragm. Thus, flexible diaphragms stretched across the cell and consisting, for example, of a fabric support coated with a paste of barytes and asbestos fibre, or of any other flexible material such as asbestos paper, have the disadvantage of sagging, thus rendering it impossible to maintain the desired spacing between the diaphragm and the mercury cathode. On



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the other hand, if the diaphragm be supported at various points inside the cell so as to prevent sagging, the arrangement of supports on the underside of the diaphragm necessarily involves an increase in the distance between the electrodes.

The present invention covers an apparatus which has horizontically disposed electrodes and diaphragm, the anode being located below, and the mercury cathode above, the diaphragm, and the mercury being separated from the diaphragm by allowing it to flow in suitably designed channels of electrically insulating and chemically resistant material, super-posed directly on the diaphragm.

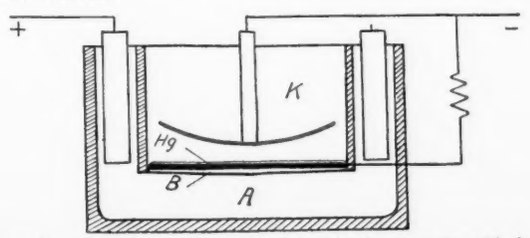
With a view to lowering the bath voltage, the anode is preferably in sheet form and preferably also of corrugated cross-section, the channels containing the mercury being located in the troughs of the corrugations. This arrangement enables the diaphragm to be laid directly on and to follow the curvature of the undulating anode, the corrugations of which are preferably sinusoidal in form. The anode is perforated.

A suitable apparatus is described and illustrated in the specification, which also states that the electrolysis of a neutral solution of sodium sulfate (density 1.31) at a temperature of 32.5° C. or slightly above, using a current density of 2,700 amps. per sq. meter at the cathode and a voltage of 6.9, furnishes an anode liquor containing 125 grams of H_2SO_4 per liter, current yield being 97%. *The Chemical Trade Journal*, Dec. 4, '36, p474.

Modified Mercury-Type Cell For Electrolytic Caustic

A modification in the construction of the mercury-type cell for the production of electrolytic alkali that has recently been worked out by H. Svensson, Helsinki, Finland, is claimed to possess numerous technical and economic advantages. He has found that by utilizing a horizontal layer of mercury, which acts as a cathode or as a bipolar intermediate electrode, the cell can be divided into two parts, the upper, or cathode, part being the decomposition cell, and the lower, or anode, part being the formation cell.

To put these arrangements into practice, the mercury is placed on a thin, porous, non-conductive plate, which acts as a support but not as a diaphragm. What happens is that the layer of mercury itself functions as the actual diaphragm through which the sodium ions penetrate, since the amalgam formed on the lower surface of the mercury rises, owing to its lower specific gravity, through the mercury to its upper surface. This amalgam is not only removed from the action of the anolyte *pari passu* with its formation, but it also rises direct to the decomposition cell without the necessity for any mechanical contrivances.



One form of the new type of cell is represented in the diagram. The mercury cathode, which acts as a bipolar intermediate electrode, is spread as a thin layer on the porous plate B, which has been smoothly ground on the cathode side. The cell is thus divided, by means of the mercury layer, into an upper cathode part K and a lower anode part A, where excess pressure is maintained by means of a hydrostatic device.

The supporting base can be made very thin and porous, since mercury, as is well known, owing to its high surface tension will not penetrate small holes under low pressures. If the supporting base has large pores, a fine porous coat, for instance, asbestos paper, can be placed between the mercury and the base.

The advantages claimed for the new type of cell are numerous, and include safety in operation, economy in power consumption, low cost of construction, small maintenance charges, and ease of operation and control. A further point is the production of a caustic soda perfectly free from chlorides and sulfates, while the chlorine gas is quite free from hydrogen.

In a representative run carried out in an experimental cell provided with a cathode surface of 1.2 sq. decimeters, a 5-normal sodium-chloride solution was electrolyzed by using an Acheson graphite anode at 70° C. under a pressure of 3.5 volts and with a cathodic current density of 0.03 ampères per square centimeter. The caustic soda solution obtained was 7-normal, the current yield corresponding nearly to the theoretical. By raising the pressure to 4 volts a current density of 0.04 ampères per sq. centimeter could be maintained. The cell could be loaded without difficulty up to 0.1 ampères per sq. centimeter and the temperature could be raised up to 90° C. *The Chemical Trade Journal*, Dec. 4, '36, p470.

Ethyl Acetate Catalytically from Ethyl Alcohol

Ethyl acetate can be formed catalytically from ethyl alcohol in the absence of mineral acids and at a relatively low temperature by passage over a catalyst composed of 99.5% copper and 0.2% cerium. This catalyst is prepared, according to Dolgov, Koton and Leczomk, by alkali precipitation of copper acetate or nitrate solution, followed after washing and drying by reduction with hydrogen at 200° C. Optimum conditions for ethyl acetate formation are a temperature of 275° C. and an ethyl alcohol flow over the catalyst of 15 c.c. per second, when a 33.7% yield is got after a single passage over the catalyst. *Chimie et Industrie*, October, '36.

Revolutionary Instruments in Industrial Control

Two New York University chemists have designed and constructed 4 new instruments which make important electron tube applications to chemical research and industrial control. Instruments were developed by Prof. Ralph H. Müller and Dr. Raymond L. Garman of the dept. of chemistry.

Instruments are a telecolorimeter, which will reproduce a color at a distant point; a cathode ray spectrophotometer, which measures the amount of light reflected or transmitted by a colored substance at every point in the entire spectrum; an automatic viscosimeter, which, by augmenting the present method of testing the viscosity of oil and other heavy liquids by an electric clock attachment, detects time intervals as small as two-thousandths of a second; and a recording analytical balance, which automatically records changes in weights to 36 ten millionths of an ounce and will run for hours, drawing a curve on a moving chart.

Absorption of Sulfur Fumes

Air pollution caused by sulfur fumes and other acidic materials emitted from power plant chimneys is yielding to a new engineering technique, according to a paper read by Prof. H. F. Johnstone and A. D. Singh of the University of Illinois at the recent A. C. S. symposium on absorption and extraction held at Columbia University.

"From an engineering standpoint there are three main parts to the problem of sulfur elimination: 1) the correct design of scrubbers; 2) the development of a suitable solvent for absorbing the sulfur compounds; and 3) the handling and disposal of large quantities of product consisting of elemental sulfur, liquid sulfur dioxide, sulfuric acid, and other compounds.

Treatment of such large quantities of gases to remove a relatively dilute constituent is a new and unique engineering problem. In the chemical industry, the largest scrubbers handle volumes of gases of the order of a million cu. ft. per hour. Examples of this operation are to be found in the recovery of gasoline from natural gas and in the purification of manufactured gas.

Financing Expansion

for Chemical Manufacturers

Present tax laws make the security distributor an essential ally of the growing chemical corporation. Through the services of the experienced underwriter, companies of moderate size can now gain access to capital markets formerly available only to the largest units. By this means the heavy tax burden that would be placed on earnings plowed back into the business can be eliminated. Expansion can be financed through the issuance of preferred and common stocks as well as debentures—with each step taking the form best suited to the company's current needs.

Simultaneously a potentially serious inheritance tax problem for the owners of closely held companies can be solved. Proper public distribution of securities, besides providing a dependable source of additional new capital, gives assurance of adequate, stable markets, capable of absorbing in emergency large blocks of outstanding stock.

Distributors Group, Incorporated has successfully effected broad distribution of securities for moderate sized chemical companies, is familiar with the financial problems of the industry and has given particular attention to the important problem of preserving management control.

Inquiries are invited from officers of established chemical companies with net worth of $500,000 or more which contemplate new capital financing or which require a broad and active market for securities already outstanding. Literature descriptive of our recent offerings of this type will be forwarded on request.

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Booklets & Catalogs

Companies whose booklets are reviewed on this page will be glad to supply readers of "Chemical Industries" with copies free, provided this magazine is mentioned and the request is made on company stationery. Your business title should also be given.

J. T. Baker Chemical Co., Phillipsburg, N. J. *The Chemist Analyst* for October contains among other articles: "Precision of Measurements," "A Rapid Method for the Determination of Copper in Plant Products," "The Micro Identification of Oils and Fats."

The C. P. Chemical Solvents, Inc., 11 Park Place, N. Y. City. "How Your Alcohol Is Produced," is an interestingly told story of the production of alcohol in Puerto Rico. Profusely illustrated.

Columbia Alkali Corp., 30 Rockefeller Plaza, N. Y. City. Two new booklets describe Columbia chlorine and sodium bicarbonate, products the manufacture of which this company entered into this past year.

Commercial Solvents Corp., Terre Haute, Ind. *Alcohol Talks* for November is devoted to an instructive discussion of sugar.

Grasselli Chemicals Department, E. I. du Pont de Nemours & Co., Wilmington, Del. A trade bulletin explains the use of "Zin-O-Lyte," which, it says, is the one process for bright zinc plating producing brilliant deposits direct from the bath without bright dipping.

E. I. du Pont de Nemours & Co., Wilmington, Del. A new booklet deals with the physical, chemical, and working properties of "Pontalite," the new plastic which is attracting such wide interest.

E. I. du Pont de Nemours & Co., Wilmington, Del. Bulletin "Steel Service" gives testing methods and pickling control charts.

E. I. du Pont de Nemours & Co., Wilmington, Del. "Metal Finishing" describes the electro-plating chemicals, equipment, services, etc., available through the Grasselli Chemicals Department.

Freeport Sulphur Co., 122 E. 42nd st., N. Y. City. *Brimstone Brevities* is issued from time to time and contains information on new uses for sulfur, experimental work, etc.

Givaudan-Delawanna, Inc., 80 5th ave., N. Y. City. *The Givaudanian* is a monthly devoted to news and information for the perfume industry. "The Dipole Theory of Odor" is discussed at length.

D. W. Haering & Co., 3408 W. Monroe st., Chicago. Company has just issued a 16-page booklet entitled, "Organic Methods of Scale and Corrosion Control."

J. L. Hopkins & Co., 220 Broadway, N. Y. City. A 30-page booklet describes the general Hopkins line of insecticides, pyrethrum powder, concentrates, plant sprays, etc.

Innis, Speiden & Co., 117 Liberty st., N. Y. City. Company has just issued a leaflet showing photographs of the company's various branch offices.

Mallinckrodt Chemical Works, St. Louis, Mo. The December price list.

A. R. Maas Chemical Co., 308 E. 8th st., Los Angeles, Calif. New leaflet lists the Maas line of "Photo-Pure" chemicals.

A. R. Maas Chemical Co., 308 E. 8th st., Los Angeles, Calif. New leaflet describes the Maas phosphates and also lists and describes the many other industrial chemicals distributed by this well-known West Coast firm.

Mathieson Alkali Works, Lincoln Bldg., N. Y. City. A specially prepared map indicates the points of Mathieson ammonia service.

Merck & Co., Rahway, N. J., The December price list.

Monsanto Chemical Co., St. Louis, Mo. Monsanto *Current Events* for December features an article on rubber by E. J. Smail, Jr., general sales manager, Rubber Service Laboratories Division, and one on August Kekulé (father of organic chemistry).

Philadelphia Quartz Co., 121 S. 3rd st., Philadelphia, Pa. A short discussion appears in the December issue of "Silicate P's & Q's" on the use of silicate in the manufacture of corrugated paper. Also it contains a list of the technical publications of the company available for distribution.

Prior Chemical Corp., 420 Lexington ave., N. Y. City. *Priorities* the new house organ of this company is largely devoted to a story on bichromates.

A. E. Staley Manufacturing Co., Decatur, Ill. "Pioneering A New Industry," is a fascinating story of the development of the soybean industry in this country. Contains a wealth of statistical data.

U. S. Industrial Alcohol Co., Lincoln Bldg., N. Y. City. New leaflet gives the benefits and uses of "Solox"—a general alcohol type solvent.

Equipment

The Austin Co., 16112 Euclid ave., Cleveland. At a time when construction is uppermost in the minds of most executives the new series of booklets, 100, 200, and 1000, showing the various types of complete buildings offered by this company is of particular interest and significance.

Beach-Russ Co., 50 Church st., N. Y. City. A new 4-page leaflet describing the company's rotary liquid pumps.

The Brown Instrument Co., Philadelphia, Pa. A new broadside entitled "Here's the Answer to Your Temperature Problem," featuring Brown thermometer controllers. Also the broadside presents a complete description of Con-Tac-Tor mercury switches.

The Chase Bag Co., 309 W. Jackson Bld., Chicago. *Bagology* is a monthly house organ which entertains and instructs as well as gives the latest information on Chase bag developments.

Edge Moor Iron Works, Edge Moor, Del. An 8-page leaflet is devoted exclusively to photographs of various special equipment fabricated by this company for the process industries.

Edge Moor Iron Works. Booklet describes in full detail the steam generating equipment produced by this company. Line drawings and photographs are given.

The Exact Weight Scale Co., Columbus. Two page circular describes the Shadowgraph—a revolutionary new principle in precision weighing.

The Foxboro Co., Foxboro, Mass. "Valves for Air-Operated Controllers," a 28-page illustrated bulletin just published provides a comprehensive review of controlled valves of both the throttling and quick-acting "open-and-shut" type, as well as modern controller accessories for extending the practical application of automatic control.

The Gehnrich Corp., Skillman ave., 35th st., Long Island City, N. Y. The products of this well-known producer of ovens, dryers, and air heaters are described and illustrated.

General Refractories Co., Philadelphia, Pa. An eight-page printing of the paper on "Refractories Used In Lime Burning" by Director of Research, R. P. Heuer and Chief Chemist, L. J. Trostel of the company has been prepared. This paper, presented at the last convention of The National Lime Association created considerable interest because it contributed new data. Continuing requests for copies have prompted the present printing as a service to the industry.

High Speed Steel Alloys, Ltd., Widnes, Lancashire, England. *Alloy Metals Review* is published on alternate months and is sent to all who are interested on application to the publishers.

International Nickel Co., 67 Wall st., N. Y. City. The uses of Monel and other high nickel alloys to defeat corrosion in gas plants are described in a new semi-technical bulletin.

International Nickel Co., 67 Wall st., N. Y. City. *Nickel Steel Topics* is a monthly which describes and illustrates the various new uses of nickel alloy steels.

International Nickel Co., 67 Wall st., N. Y. City. *Nickelsworth* is regularly issued to show the various adaptations of Monel and rolled nickel in the various industries. A short discussion of corrosion features the current issue.

International Tin Research and Development Council, 149 Broadway, N. Y. City. Tinplate and Tin Can Manufacture (Bulletin 4) 144 pages, is a detailed survey of American methods. Contains 159 illustrations.

Link-Belt Co., 300 W. Pershing Road, Chicago. "Race Horse Speed with Draft Horse Endurance," is the theme of a new 12-page Book No. 1795 picturizing the advantages of Speed-o-Matic hydraulic power control of the mechanical operations of Link-Belt crawler shovels, draglines and cranes, as compared with the laborious manipulation of conventional long-throw mechanical levers. Speedier operation, greater output, elimination of operator fatigue, are features claimed for the new control.

Link-Belt Co., 519 N. Holmes ave., Indianapolis, Ind., has just released a very distinctive 96-page, 1936 edition of Data Book No. 125 on Silverstreak silent chain drives of fractional h.p. up to 2000 h.p. New data book is of 8½" x 11" page size, and in its manner of presentation reflects the progress of approximately 5 years since the preceding edition of Book No. 125 was published.

The N. J. Zinc Co., 160 Front st., N. Y. City. "Supplement to a Visual Report of Progress," presents the astonishing progress which has been made in the die casting industry since the publication of the original "A Visual Report of Progress" last year.

The N. J. Zinc Co., 160 Front st., N. Y. City. "Zinc Metals and Alloys," gives the physical and chemical properties, trade-names, etc., of the various metals and alloys of the company.

The Pangborn Corp., Hagerstown, Md. Leaflet describes Type "LG" Airless Rotblast Cleaning Table.

The Pfaudler Co., Rochester, N. Y. *The Glass Lining* is an equipment and service magazine for the dairy, food, and chemical process industries. Latest issue features an article on the manufacture of Armour's pharmaceuticals and organics; contains a very capable summary of the present state of business; tells the story of the extract division of Liquid Carbonic. Each issue is filled with instructive material.

Patterson Foundry & Machine Co., East Liverpool, Ohio. This company has just issued a new 71-page illustrated book which describes in complete detail its line of agitators and mixers.

The Republic Steel Corp., Republic Bldg., Cleveland, Ohio. This producer has prepared a new series of booklets on Enduro stainless steel, 5 in number, characterized by layout and typographical treatment radically different from Republic's previous publications on this product. Cover illustrations are reproductions of photographs of various mill operations in the production of Enduro. All of the booklets are profusely illustrated. First in the series is a booklet of general nature, explaining the reasons for the amazing rise in popularity of stainless steel and illustrating many of the more important applications of Enduro. A highly useful feature of the booklet is a chart listing the analyses and detailed properties of 13 of the principal types of Enduro, contrasted with the properties of a common carbon steel, S.A.E. 1020. Another useful table sets forth the degree of corrosion-resistance of 4 leading types of Enduro in the presence of some 300 foods, chemical products and reagents. This data is the fruit of a tremendous amount of research on the part of Republic's metallurgists. A second book features detailed data on Enduro 18-8 and its several variations. The third booklet is devoted to the straight-chromium types of Enduro—AA, S, S-1, and FC. The fourth booklet contains information on the heat-resisting types of Enduro—HCN, HC and NC-3. The fifth booklet treats Enduro 4-6% chromium steels. These latter steels are not stainless but are intermediate between ordinary carbon and stainless steels.

The South Bend Lathe Works, South Bend, Ind. A new 24-page catalog announces the new 1937 model 9-inch workshop precision lathe.

Stearns Magnetic Mfg. Co., 675 S. 28th st., Milwaukee, Wis. The engineering department has in the mails an interesting booklet describing and illustrating its line of Type "K" High Duty Magnetic Separators. It is cataloged as Bulletin No. 700 and supersedes Bulletin No. 10.

C. J. Tagliabue Mfg. Co., Park and Nostrand aves., Brooklyn, N. Y. Catalog No. 699D discusses Tag oil testing instruments for petroleum products, including Tag etched stem thermometers, enclosed scale thermometers, and hydrometers for general laboratory use.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. A new publication entitled, Types SH and DH Speed Reducers has recently been issued describing single and double reduction units of the single helical gear type with anti-friction bearings and splash lubrication for application in general industrial and mining operations.

Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa. A leaflet describing the new and improved design of Westinghouse Type SK DC motors has recently been announced. For use to withstand an internal explosion of gas or coal dust without injury to the equipment and without emitting flames or sparks which would ignite surrounding gas, the motors described range in sizes from 5 to 75 horsepower and 115, 230 and 550 volts.

Worthington Pump & Machinery Corp., Harrison, N. J. W-323-B1A is devoted to detailed data on centrifical pumps arranged for automatic priming electrically operated.

Worthington Pump & Machinery Corp., Harrison, N. J. "Compressed Air at Lower Cost," is the name of a recent booklet.

Worthington Pump & Machinery Corp., Harrison, N. J. A new 8-page bulletin illustrating and describing the improved Mixflo centrifugal pump has been issued. It is widely used in sewage disposal.

When you think of Drums—
Think of THORNTON

For Shipping Solids, Semi-solids and Liquids
you can't beat
THORNTON BOLTED RING SEAL DRUMS
with
Simple and Secure
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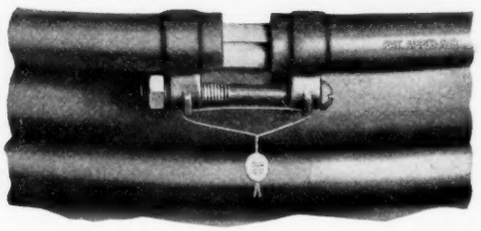

Secures with a simple bolt and nut—easy to fasten and unfasten.

The lugs are mechanically interlocked with the ring—a solid connection.

Sealing wires or shipping tags can be attached as illustrated.

Made in any size, 10 to 70 gallons.

Write for complete information about this and other Thornton steel containers.

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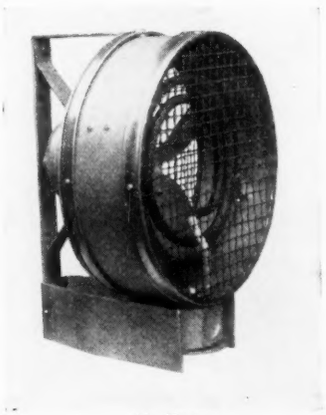

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for the Chemical and Process Industries

Electric Furnaces up to 2600° F.

Electrical Heating Units for heating air, water and liquids. See Leaflet TC-30

Electrically Heated Laboratory Apparatus. See Leaflet TD-23

Kettles, electrically heated, up to 1000 gallons for oils, compounds, etc.

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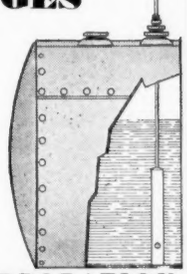
TANK GAUGES



FOR:
ALL KINDS OF LIQUIDS

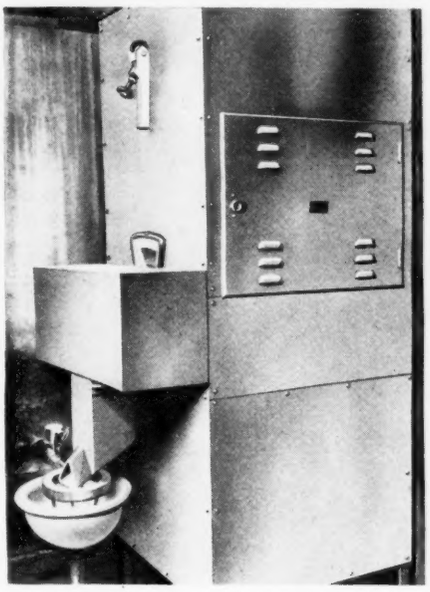
IN:
ANY TYPE OF TANK RESERVOIR OR CONTAINER

PETROMETER CORPORATION
LONG ISLAND CITY, N. Y.

New Equipment

Batch Weighing Feeder Machines QC 411

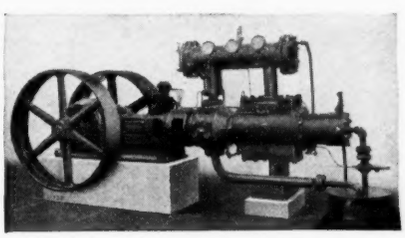
To very accurately dose water with dry chemicals by actual weight, a well-known manufacturer of equipment has developed a new line of continuous, batch weighing feeder machines.



These weigh out the desired amount of material in batches, and dump them, or discharge them every 15 seconds. Machine is made up of: (a) A supply hopper equipped with a noiseless electric vibrator that prevents any arching over or clogging up of material. (b) A vibratory feeder that flows the chemical from the big supply hopper to a weigh hopper mounted on an accurate, even balance type of scale. (c) This even balance scale is equipped with electric controls that stop the vibratory feeder when exactly the right amount of material has been fed into the weigh hopper on the scale. (d) An electric clock control then dumps the contents of the weigh hopper, every 15 seconds, into the solution pot.

Newly Designed 3-Stage Compressors QC 412

An improved line of single horizontal three-stage compressors for pressures from 750 to 2,500 lbs. is now offered. They are particularly well suited for higher pressures, since the compression cylinder requires only one packing box, which is subjected solely to moderate pressures. Leakage is thus reduced to a negligible and controllable factor. This feature is especially desirable when compressing valuable or inflammable gases. Compressor is ideally applicable for high air pressure for any purpose, also for the compression of oxygen, hydrogen, helium and other special gases as well as refinery gas or straight natural gas.

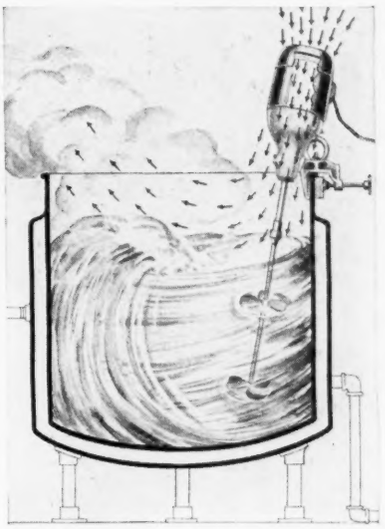


New Steam Generating Unit QC 413

The design and testing of a new type of steam-generating unit of good efficiency, relatively light in weight and requiring minimum of space, was described jointly by the General Electric, Babcock & Wilcox, and Bailey Meter companies at the annual meeting of the American Society of Mechanical Engineers, in N. Y. City, Nov. 30th. A. R. Smith of the G. E. Co., and P. S. Dickey of the Bailey Meter Co. presented the paper at the meeting. New type of steam-generating equipment has been named the Steamotive. Due to the compact arrangement of the Steamotive unit, it constitutes what is practically a packaged power plant.

Portable Explosion-Resistant Mixers QC 414

Portable mixers, equipped with totally enclosed air-jacketed motors and explosion-proof air-jacketed motors are an exclusive patented development just released. The developments are covered by U. S. Patents Nos. 2042511 and 1817353. These portable safety mixers, equipped with totally enclosed air-jacketed motors, can be used over steaming kettles, jacketed tanks, and other receptacles which throw off steam and acid fumes. Emanations from the mix are blown away from the motor and rendered harmless to the motor windings.

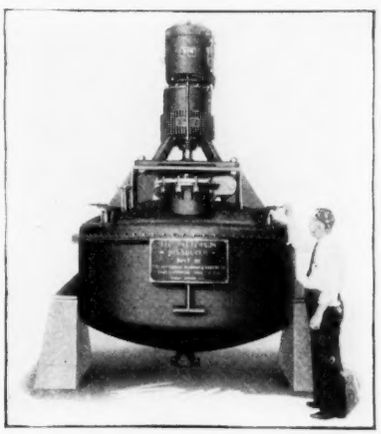


Air is drawn into the top of the motor by a fan, and circulated through the entire motor housing by a jacket. A steady stream of cool air is thus afforded, maintaining the proper motor temperature. Dirt, grit, and dust are kept entirely out of the windings and bearings.

These portable explosion-resistant mixers, equipped with explosion-resistant motors carry the underwriters label approved for Class 1, Group D applications permitting their use on explosive batches in hazardous locations. These mixers have the same patented features as the other totally enclosed air-jacketed models, and carry in addition the Approved Label of the Underwriters Laboratories.

New Dissolver QC 415

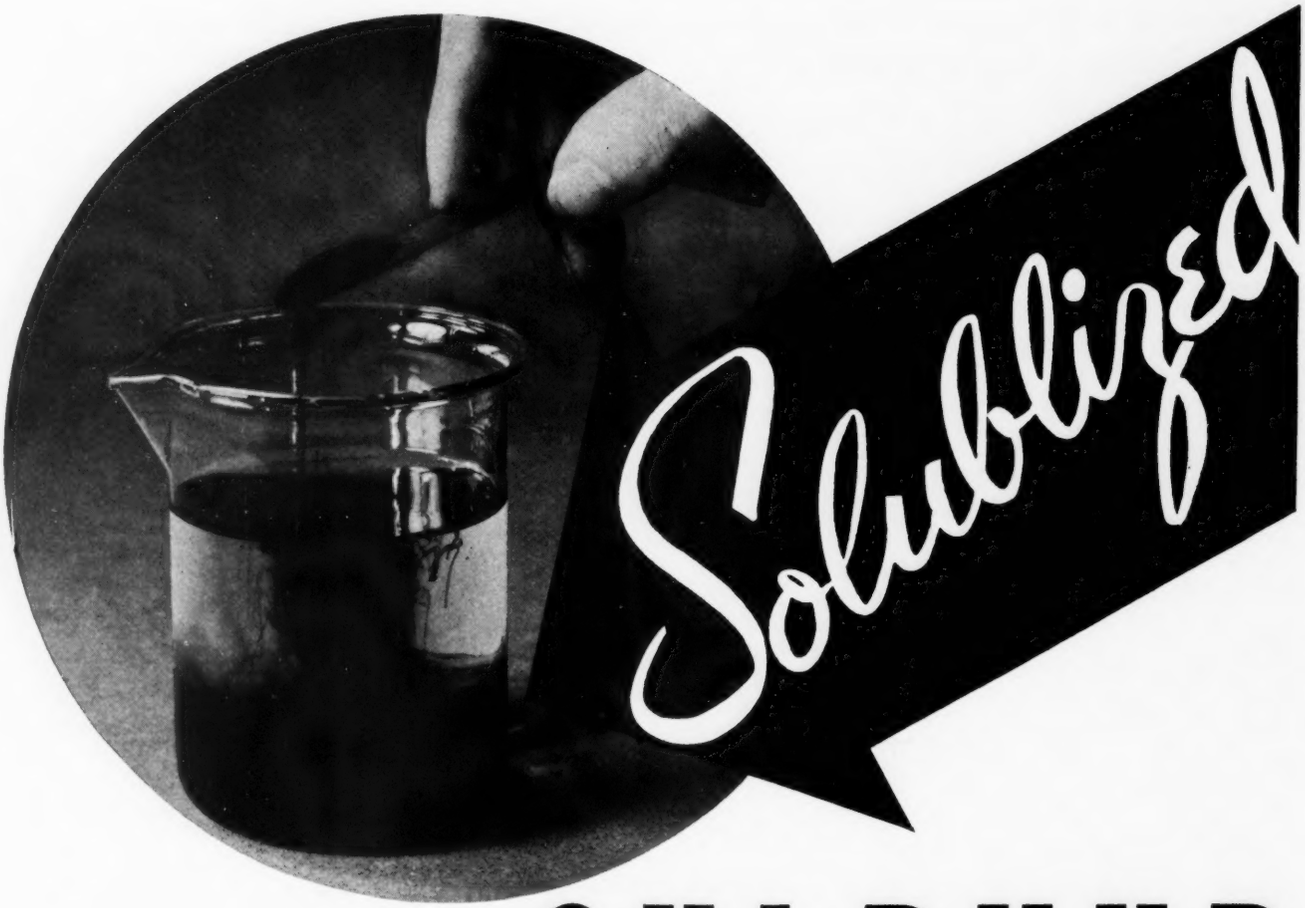
A new dissolver for cutting cotton, dissolving cellulose acetate and natural and synthetic resins of all kinds, and for use also in the dispersion of pigments in cotton and synthetic solutions and for general dissolving of all kinds has been perfected. Machine is built for handling materials of high viscosity, low viscosity or the entire range from high viscosity to low viscosity.



All dangers from explosion have been eliminated and there is no loss of solvent during dissolving operation. Power consumption is very low. An ordinary charge of cotton can be dissolved in less than one-half hour.

New dissolver is built in both plain and jacketed types, also for internal working pressures up to 100 lbs. per sq. inch. It is obtainable in plain steel, stainless steel, aluminum, and other metals, and is built in a wide variety of sizes designed to take care of the needs of all users, no matter how large or how small their requirements may be.

Producers of the equipment mentioned on this page:—QC 411, The Syntron Co., Pittsburgh, Pa.; QC 412, Worthington Pump & Machinery Corp., Harrison, N. J.; QC 413, General Electric Co., Schenectady, N. Y.; QC 414, Mixing Equipment Co., Rochester, N. Y.; QC 415, The Patterson Foundry & Machine Co., East Liverpool, Ohio.



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..thru accented solubility and extraordinary working properties.

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FEATURES THAT RECORD *Uniform Superiority*

See for Yourself! Make this test!

• THEY *Are* SOLUBLE IN WATER!

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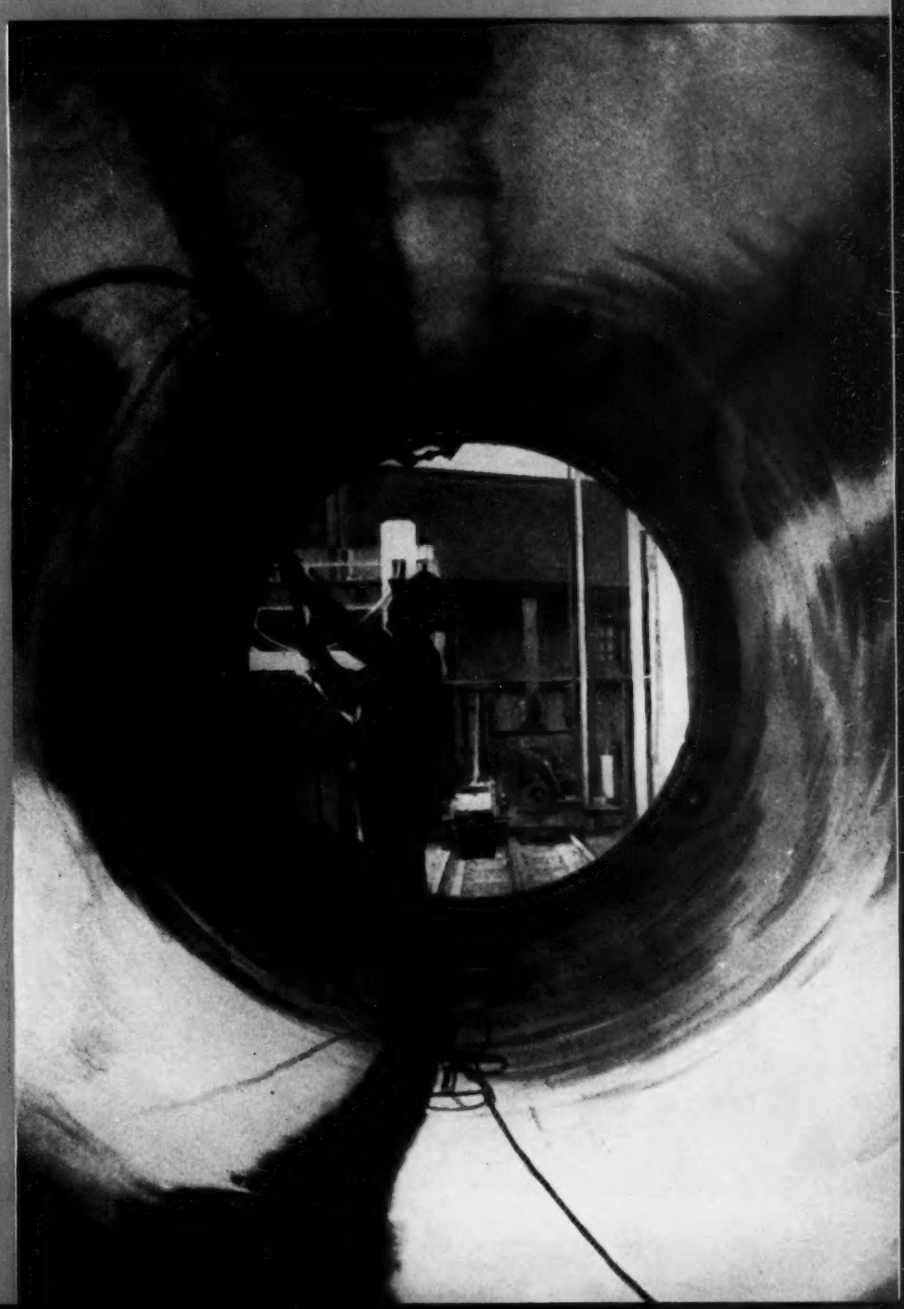
A DIVISION OF AMERICAN CYANAMID COMPANY

New Products and Processes

A Digest of Chemical Uses and U.S. Patents



Tar spraying the inside of water mains. Photograph courtesy Reilly Tar and Chemical Corp.

SHARPLES

Amyl Compounds

Sharples Industrial Amyl Compounds are constantly opening up new ways of solving process problems. Introducing an amyl group into your present product may simplify your process, improve the oil solubility, give a more desirable melting or boiling point—or it may duplicate the properties of your present material at a lower cost.

Any one of these advantages would be worth while—and in numerous instances combinations of two or more of these features have been realized.

Our facilities are at your service.

*Pentasol (Pure Amyl Alcohol)

*Pent-Acetate

*Pentaphen (Para-Tertiary Amyl Phenol)

Dimethyl Ethyl Carbinol • Triamylamine

Amyl Naphthalene • Diamyl Sulphide

Methyl Propyl Carbinol • Diamylamine

Amyl Mercaptan • Dichloro Pentanes

Iso-Butyl Carbinol • Diethyl Carbinol

Secondary Butyl Carbinol • Diamylene

Mixed Amyl Chlorides • Amyl Benzene

Normal Amyl Chloride • Diamyl Ether

Normal Butyl Carbinol • Monoamylamine

*Trade Mark Registered

SHARPLES SOLVENTS

THE SHARPLES SOLVENTS CORP., 2301 Westmoreland Street, Philadelphia Pennsylvania

Uses of Zinc in the Textile Industry

By H. Peters

ZINC is rarely given due recognition in textile technology. This metal and its compounds are well worth studying and a knowledge of the properties of zinc will often enable the processor to get over some difficulty or perform some useful service in the works.

Powdered zinc metal is employed in the reducing vat for dyes—notably the "zinc-lime vat" in which vats colors are converted to the leuco form and applied to textiles. Thus 2 ozs. of zinc powder are required in conjunction with 5 lbs. of quicklime per lb. of 20% indigo paste. There is an important point often overlooked by technologists and frequently omitted mention in text-books; namely, that the zinc is used essentially for its power to reduce and not on account of its content of that metal. It is the free metallic zinc which performs the reducing, not the oxide with which it is frequently contaminated. An analysis for total zinc might be quite misleading for it would not discriminate between zinc metal and zinc oxide. The chemist who wishes to evaluate a product must estimate total zinc in order to ascertain that other contaminating metals are not too much in evidence, but he must also determine the amount of zinc present as free metal. One means of doing the latter operation is to prepare a standard solution of iron alum of known strength, and then add acid and a weighed portion of the zinc to reduce part of the iron to the ferrous condition. The unreduced excess should then be titrated; the amount of ferric reduced to ferrous indicates the reducing capacity of the zinc.

Sulfide of zinc has found much application in recent years for delustering rayon on account of its whiteness, opacity and freedom from destructive action on delicate fibers. A paste is made containing the sulfide in water together with an emulsifying agent. The goods are impregnated for half an hour, hydroextracted and then dried. U. S. P. 1,756,941 to the Celanese Corporation of America describes the application of zinc sulfide to acetate rayon goods by a double impregnation process in which the compound is precipitated within the fibers. As a result, acetate rayon is said to acquire a permanent dullness of luster and at the same time, begets an affinity for direct-cotton dyestuffs.

Zinc sulfide is applied to cellulose acetate and other synthetic filaments in the recent U. S. P. 2,033,976, for a somewhat extraordinary and novel purpose—in order to render them phosphorescent. The inventor, Henry Dreyfus, applies phosphorescent zinc sulfide to the filaments directly after their formation and while they are still in a swollen condition. We have already had fluorescent dyestuffs which show a peculiar luminosity when viewed at certain angles, but a ghostly finish which glows in the dark would seem to strike an entirely new note. It may, however, be possible to obtain some very unusual fabrics in this way, such as would display well in a ballroom.

In the wet spinning of regenerated cellulose filaments, the use of metallic sulfates, and in particular, zinc sulfate, has been considered worthy of patenting. In Brit. Patent 259,386, the inventors claim that when zinc salts are used in the spinning bath, a reduction in the ripening time can be brought about. In the coagulating bath, the I. G. Farbenindustrie A. G. claim that 0.1% of zinc sulfate enables threads with finely channelled surfaces to be obtained (Brit. Patent 290,231).

The mordanting action of zinc salts is made the subject of Brit. Patents 309,899 and 306,611, whose aim is to endow cellulose acetate fibers with an affinity for basic, acid and direct dyes.

Discharge pastes for cellulose acetate printing in which zinc thiocyanate is used are protected by Brit. Patent 401,350. This compound apparently exerts a swelling action on acetate rayon and aids the reducing action of the formaldehyde sulfoxylate.

Weighting of cellulose acetate may be done with zinc salts, says Brit. Patent 309,876 and the advantage of this process over tin weighting is in the comparatively low temperature at which it may be applied, making for the minimum of fiber destruction.

Waterproofing with zinc alginate, formed by double decomposition on the fabric, is the subject of German Patent 314,969, which is claimed, incidentally, to resist boiling water. A method of flameproofing textile goods of cellulosic material consists of dipping first in a solution of a soluble zinc salt and then in a bath of tungstate of soda.

Uses of Zinc Chloride

Zinc chloride is extensively used as a preservative for starch and other textile sizes afterwards to be applied to cotton warps. Five to six pounds of the chloride are required per 100 lbs. of starch. Out of the practice of sizing warps in this way but not wefts has arisen a technique for determining the length of time which goods have been stored or the conditions of storage. Geake (*Journal of the Textile Institute* 1932, 279T) has studied the distribution of zinc in sized goods and shows how it bears a relation to the past history of the same.

On certain occasions zinc may prove a source of trouble—due to spots, Bauch (1936) states that spots of zinc soap may make their appearance during finishing when vessels of zinc, or iron plated with zinc (galvanized metal work) are used in the department and acid liquors are employed. They are said to look like lime spots and to be removable by rinsing with water or soap suds. Dilute acids may be applied to more deeply fixed spots, followed, of course, by rinsing with water and soap.

The writer does not see why hexametaphosphate solution should not be tried, since hot strong solutions dissolve zinc soaps and salts as well as lime compounds.

To prepare a test solution for zinc, Cone and Cady's reaction is reliable and specific, and so the following mixture may be made up: 1 gram of diphenylamine is dissolved in 100 c.c. of glacial acetic acid to which is added 5 c.c. of 0.5 per cent. aqueous potassium ferricyanide. (Warning—ferrocyanide will not do!) In the presence of zinc this reagent gives a dark green to purple turbidity or precipitate. Those who are new to the test are advised to do the mixing with a little zinc sulfate solution first to see what happens.

Cone and Cady have worked out a quantitative method for estimating compounds of zinc based on the above color reaction. This consists of a volumetric titration with an endpoint which requires practice to see. While this process has much to recommend it, it is not likely to prove easy to a beginner. It also is of doubtful value for determining small amounts of zinc. *The Textile Colorist*, p.826.

Synthetic Resins in Textile Finishes

The possibility of improving textile materials by treatment with synthetic resins, as suggested some three years ago by the anti-crease process of the Tootal Broadhurst Lee Co., Ltd., is now being actively investigated along several lines, and already a number of useful treatments have been discovered, according to the *Manchester Guardian Commercial*.

Rosin in Road Tars

Use of pine rosin in road surfacing compositions has been studied for three years by the Highways Department of France. Results of trials on various roads appear to justify addition to road tars. It was found advisable to convert the crude rosin into the resinates of calcium, zinc, or aluminum, the two former being of particular interest in combination with tar owing to the marked increase in viscosity which opened the way to utilization of the low viscosity tars produced in modern gas-works.

Manufacture Magnesium

In a review of methods of magnesium manufacture in *Industrie Chimique,* Nov. '36, attention is drawn to the recent process of H. Lavoisier (French Pat. 802,579), based upon decomposition of magnesium sulfide obtained in turn by reduction of the sulfate.

Rayon as Substitute for Paper

A type of rayon suitable in place of paper for printing, and offering advantages of lower cost and greater durability, is reported to have been successfully produced by a Czechoslovakian scientist. *Chemical Age,* October 10, '36.

Novel Paint for Sails

The red mud obtained as a by-product from aluminum manufacture can be used for painting sails of fishing boats. Canvas so treated is stated to hold up well under all conditions. From a French report to the Department of Commerce.

Impact Strength of Moldings Increased

Moldings with more than three times the shock resistance of standard plastic pieces are obtainable with 1547 Black, new product of General Plastics, No. Tonawanda, N. Y. It has an impact strength of 0.5 A.S.T.M. It has a weight of 22.4 grams per cu. in. and permits machining and sanding of the molding and subsequent buffing back to the normal rich lustre, without exposing filler spots or impairing the normal qualities of the material.

Orchids Nourished by Rooting in Glass Wool

Orchids can be grown to good advantage by rooting them in glass wool. Dr. Geo. W. Morey of the Carnegie Institution in Washington, who made the experiments, proved that glass wool is better than the organic substances commonly used, because it does not decay, so that the plants do not need to be lifted from time to time, and disturbances to their roots are thereby avoided.

Corrosion-resistant Coating

Tornalac, a corrosion-resistant coating made from Tornesit, which is unaffected by caustic, alkalies, acids, chlorine and brine solutions, is being marketed by Paper Makers Chemical Dept. of Hercules. It may be applied to metal, wood and concrete and has unusual merit for the protection of equipment which is subjected to corrosion by chemicals. Colors: gray, red, black, cream, white and aluminum.

Silicate Soaps

"H-S Compound," new silicate produced by Standard Silicate, Pittsburgh, for the manufacture of laundry chips, is said to produce better appearing soaps for the lower priced market.

British Fireproofing Agent

Details on "Faspos," new fireproofing agent for treating timber, plywoods, wallboards, and paper were made public at a demonstration at the works of Lighting Trade, Ltd., Earlsfield, London, S.W. 18, England. Qualities and uses of this chemical, so far as it affects the above products, are described in a booklet "Faspos—The Fireproofing of Wood, I.C.I., Ltd., 1st edition, 1936."

New German Pigment

"White Lead Z," a pigment consisting of 70% pure white lead and 30% zinc white, is being marketed in Germany by member firms of the Verein Deutscher Bleifarbenfabrikenten E.V. Product is marketed as a paste and its zinc oxide constituent is prepared by a special process.

Sizing for Artificial Fibers

Rayonal, a pure, inoxidizable sizing, can be used with equal advantage for sizing all types of artificial fibers; viscose, cuprammonium, and acetate, in any make-up such as spinning cakes, cross-wound bobpins, skeins and beams. Manufacturer, W. A. Scholten's Chemische Fabrieken, Groningen, Holland, states that yarns sized with this can be stored for an unlimited time with no alteration of the rayon or solubility of the size.

Molybdenum Oxide in Paints and Rubber

Experiments on the possible use of molybdenum oxide in paints and rubber are reported by H. A. Gardner in *Scient. Sect. Circular,* No. 513, August '36.

Insulating Material for Binding Cables

"Vinifol," an insulating material which can be used for binding cables, is a recent development of the I.G. Use of company's "Igelit" C.P. resins is involved, and material is said to have following properties:

Sp. gr., 1.47.
Tensile strength, 650—750 kg./sq. cm.
Flexibility, 4—5%.
Direct surface resistivity (per 1,000 volts direct current), 1 mil. M.O.
Dielectric constant (per 50 Hertz. 200 volts, 22° C.), 3.1.

Covered Latex Yarn

Filatex, a covered latex yarn adaptable to the knitting and weaving trades among other industries, is said to embody various new and novel features protected by patent, and may be covered with cotton, acetate or silk in various colors and in all sizes, based on a cotton count. New yarn is being produced by the Filatex Corp., 1450 B'way, N. Y. City.

Non-toxic Road Tar

A non-toxic tar, approved by the British Road Tar Ass'n, is called "Brotox." Sir David Milne-Watson, Pres., in addressing the Ass'n recently, said he hoped it would lead to a growing demand for tar to be used on roads draining into fishing streams. It has durable and excellent non-skid properties. *Chemical Trade Journal,* Nov. 20, '36, p.428.

Oyster Purification

The first oyster purification plant in the world has been completed at Brightlingsea, near London. Here, through the use of chemicals and sterilized sea water, shellfish and bivalves are cleansed, to obviate the danger of disease.

Sewage Precipitants

Laboratory trials on chemical precipitants for sewage have been carried out recently by the Rivers Dept. of the Manchester Corp., the results being contained in the report of the Dept. which will be issued shortly. Investigations are also noted on the aluminoferric process. *Chemical Trade Journal,* Nov. 6, '36, p.383.

Photography in Three Natural Colors

A photographic film which produces diapositives in three natural colors—red, yellow and blue—is being marketed in Germany according to a report issued by the Dept. of Commerce. Emulsion of the film consists of three colorless layers, each containing a different organic dye, normally colorless, but possessing the property of entering the silver into a colored chemical compound.

Cuprammonium Solutions in Various Fabrics

Cuprammonium solutions in the manufacture of multiple fabrics are mentioned in E. P. 443,635. It is stated that there are various modifications of the process, a whole series of finishes being obtainable. *Dyer & Textile Printer,* Oct. 9, '36, p.375.

Casein in Crease-Resistant Process

Use of casein in rendering textiles crease-resistant without affecting their natural soft handle is the subject of E. P. 452,766. Process is outlined in *Dyer & Textile Printer,* Oct. 9, '36, p.375.

Extraction of Tobacco Seed Oil

Extraction of tobacco seed oil on a large scale is being planned in Italy. Preliminary tests proved that the first pressing yields a golden yellow oil and the second pressing a considerably darker oil, while oil produced by extraction is reported to be even darker. For soap manufacture its incorporation to the extent of about one-fifth with coconut oil with the addition of a little tallow is recommended. It also possesses interest for the lacquer industry. Tobacco seed oil is completely fluid at 10° C. *Chemical Age,* Oct. 10, '36.

Artificial Graphite from Anthracite

Successful experiments with a view to the production of artificial graphite from anthracite have been carried out at the Elektrough Factory at Kudinovo. With a declared ash content of only about 1%, product is claimed to be suitable for the manufacture of elements and electrodes for the accumulator industry. *Chemische Industrie,* Oct. 3.

Soapless Shampoo

"Martinol," introduced by Michel Export Co., 95 Broad St., N. Y. C., is a modern higher fatty alcohol base for the manufacture of hair preparations.

New Manganese Process

New process of extracting manganese from ore bodies with the use of electricity, developed by scientists at the U. S. Bureau of Mines laboratory at Pioche, Nev., may give the State a new $1,000,000 a year industry.

New Vegetable Oil

Jojoba Oil, a liquid wax, composed of unsaturated acids and alcohols combined into esters, is a discovery of the Bureau of Chemistry and Soils, U. S. Dept. Agriculture. The oil, which is described as unique, is obtained from the seed of a shrub known as *Simmondsia Californica.*

German Molding Composition

A German molding composition in which expensive textile fibers are replaced by cheap wood cellulose fibers as a reinforcing filler is entirely different from the resin-impregnated paper which is used for making laminated products. Made by Peter Temming, Aktiengesellschaft, Gluckstadt, Germany.

New Process for Heavy Oxygen

A process which produces "heavy oxygen" at a speed 1,000 times greater than that attained by any other process is in operation at Columbia University, according to an announcement by Prof. Harold C. Urey.

Low Cost Insulating Brick from Shale

A low-cost insulating brick for face brick backing in house construction produced from N. Carolina shale, is described in a bulletin of the Engineering Experiment Station, University of North Carolina, Raleigh. Production of such a brick is important as a result of the use now being made of air-conditioning equipment and the demand for temperature control within the home.

Zinc Oxide for Preserving Hides

A process employing zinc oxide for the preservation of hides and skins which has been developed in Germany is said to overcome some of the undesirable features of salting, especially the so-called salt spots. From a report to the U. S. Dept. of Commerce.

Cement for Tile-Setting

A cement designed to reduce the cost of tile-setting, particularly in connection with floor tile, has been developed by the Dept. of Ceramics, Rutgers University, New Brunswick, N. J. It is believed this improved method has opened many possibilities for tile in new fields.

Fiber Board from Pulp of Cane

"Canec," a by-product from the cane pulp, after the sugar has been extracted, has been developed in Hawaii. The pulp is chemically treated, rolled and made into first class board which has great insulating powers for heat and cold, resists termites, takes paint well and is even attractive in its natural state.

Pale Processing Varnish

"Berco Pale Processing Varnish" has been developed particularly for the complete protection of all coated and printed jobs by North Bergen Varnish Corp., 989-39th St., No. Bergen, N. J. It is said to offer unusual protection to caps, crowns, and cans.

Brazing Alloy Increases Applications

Improvements and refinements in manufacturing Phos-Copper brazing alloy are announced by Westinghouse. Increasing its field of application, the new processes include annealing and pickling to insure freedom of any carbonaceous deposit on the surface which might interfere with the production of leak proof joints. This makes the new alloy especially suitable for applications such as refrigerator parts where leak proof joints are a necessity.

Mercerizing and Wetting-Out Agent

Leophen K, a highly effective mercerizing auxiliary of I. G. manufacture, is being offered by General Dyestuff. It is not only an excellent wetting-out agent for mercerizing liquors, but also has the property of not forming a consistent foam. It enables quick running of the machine without risk of the trough overflowing.

Non-Slip Finish for Rayon Fabrics

Appretan S F, a non-slip finish for rayon fabrics, is recommended for rayon piece goods such as linings, etc., to prevent the warp and weft threads from pulling apart. It sticks the warp and filling threads together with an elastic film, at the same time acting as a filling agent. An I. G. product offered to the trade by General Dyestuff.

Month's New Dyes

General Dyestuff releases include: Brilliant Benzo Violet BA, a direct dyestuff which produces very bright shades of a bluish violet on cotton, rayon, pure or weighted silk. Diazo Fast Yellow RR which, when diazotized and developed with Developer ZA, yields pure yellows of excellent dischargeability and good wash and light fastness. Astra Cyanine B is a straight basic color distinguished by very good dischargeability. Toluylene Yellow R L is a direct dyestuff characterized by very good dischargeability. Company offers for I. G., Alizarine Supra Sky SE, a new acid color, which when dyed from a Glauber's salt-acetic acid bath produces bright blue shades of good fastness to light, washing, and salt water. For General Aniline company offers Fast Orange 5 R A S, a new direct orange, having the principal advantage that it draws well on cotton even at a low temperature without staining animal fibres to any extent.

U. S. Chemical Patents

A Complete Check—List of Products, Chemicals, Process Industries

Agricultural Chemicals

Production of superphosphate fertilizer from phosphate rock and an acid. No. 2,061,567. Leroy Henry Facer, Phelps, N. Y.

Method of digesting phosphate rock with hydrochloric acid. No. 2,061,639. Warren R. Seyfried, Birmingham, Ala.

Cellulose

Manufacture of cellulose from lignin-containing cellulosic materials. No. 2,061,616. Henry Dreyfus, London, Eng.

Composite film and picture and method of producing them. No. 2,061,678. Clyde Scott, East Orange, N. J.

Composition containing a cellulose derivative and as a solvent a mixture of water and dimethyl ether of ethylene glycol. No. 2,061,732. Emmette F. Izard, Elsmere, to du Pont, Wilmington, Del.

Manufacture of cellulose pulp. No. 2,061,935. Pierre Delcroix, Voiron, Fr., to Papeteries Navarre, Lyon, Fr.

Process for producing colored sound film. No. 2,062,304. Bela Gaspar, Berlin-Schoneberg, Ger.

Process for production of organic derivative of cellulose films by casting the films from a solution of anhydrous organic cellulose derivative in an anhydrous volatile solvent containing up to 10% of a water-miscible non-volatile solvent. No. 2,062,402. Camille Dreyfus, N. Y. City, and George Schneider, Montclair, N. J., to Celanese Corp. of America, Del.

Composition comprising an organic derivative of cellulose and a halogen nuclear substituted phthalic acid esterified with methyl, ethyl, amyl, cetyl, or benzyl alcohol. No. 2,062,403. Henry Dreyfus, London, Eng.

Method for regulating the pretreating and esterifying of cellulose. No. 2,063,324. Carl J. Malm and Gale F. Nadeau, Rochester, N. Y., to Eastman Kodak Co., Jersey City, N. J.

Cellulose ester composition films having elasticity, resistance to tearing and resistance to creasing. No. 2,063,620. Hans Persiel, Gerhard Balle, Franz Grom, and Rudolf Semmig to I. G., all of Frankfort, Ger.

Process for concentrating aqueous aliphatic acids recovered from cellulose esterification processes. No. 2,063,940. Herbert E. Martin, Cumberland, Md., to Celanese Corp. of America, Del.

Manufacture of organic derivatives of cellulose. No. 2,064,226. George W. Seymour, Cumberland, Md., to Celanese Corp. of America, Del.

Method which comprises mixing an alkali metal sulfoantimoniate with a viscose solution, and forming a regenerated cellulose article from said viscose. No. 2,064,355. René Picard, Vaulx-en-Velin, and René Fays, Gauchy, France, to du Pont, Wilmington, Del.

Method which comprises mixing an alkali metal hydrosulfite with a viscose solution, and forming a regenerated cellulose article from said viscose. No. 2,064,356. René Picard, Vaulx-en-Velin, and René Fays, Gauchy, France, to du Pont, Wilmington, Del.

Activation of cellulose for conversion into cellulose derivatives. No. 2,064,384. George A. Richter and James W. McKinney to Brown Co., all of Berlin, N. H.

Cellulose derivative coating composition containing from 10 to 50% by weight of finely divided manganese dioxide. No. 2,064,608. Robert Tyler Hucks, South River, N. J., to du Pont, Wilmington, Del.

Coal Tar Chemicals

Preparation of nitro-alpha-naphthylamine by nitrating an alpha-naphthylphthalimide and hydrolyzing the resulting nitro-naphthylphthalimides. No. 2,061,627. Herbert Henry Hodgson, Huddersfield, Eng., to Imperial Chemical Industries Ltd., Gt. Brit.

Preparation of arylamines by reacting an aromatic halogen compound with ammonia in the presence of a catalyst. No. 2,062,349. William S. Calcott and Louis S. Bake, Penns Grove, N. J., to du Pont, Wilmington, Del.

Production of acetylamino-naphthol-sulfonic acids. No. 2,062,368. George Maurer, Carneys Point, N. J., and Stanley G. Ford, Wilmington, Del., to du Pont, Wilmington, Del.

Improved 4:4′-dimethyl-6:6′-dihalogen thioindigo. No. 2,062,443. Paul Whittier Carleton, Penns Grove, and Edwin Lorenzo Mattison, Carneys Point, N. J., to du Pont, Wilmington, Del.

Manufacture of py-3-hydroxytetra-hydroxynaphthoquinolines. No. 2,062,458. Hans Lange, Dessau-in-Anhalt, and Johann H. Helberger, Cologne-Mulheim, Ger., to General Aniline Works, N. Y. City.

Composition for solution in liquid hydrocarbon fuels comprising dinitrobenzene dissolved in methyl formate. No. 2,062,463. Louis E. Levi, Milwaukee, Wis.

Benzophenanthrenarylides. No. 2,062,614. Albert Schmelzer, Cologne-Mulheim, and Curt Schuster, Ludwigshafen-on-the-Rhine, Ger., to General Aniline Wks., N. Y. City.

4.6-diamino 2-alkyl pyridines and processes for producing the same. No. 2,062,680. Herman J. Schneiderwirth, Laurelton, N. Y.

Sulfation products of aliphatic carbinols and a process of preparing them. No. 2,062,842. Adolf Steindorff and Hans Lange, Frankfort, and Karl Horst, Hofheim-on-Taunus, Ger., to General Aniline Wks., N. Y. City.

Polycarboxylic acid esters. No. 2,062,917. Walter E. Lawson, Woodbury, N. J., to du Pont, Wilmington, Del.

Mixtures of esters of monocarboxylic carbocyclic acid with mixtures of alcohols obtainable by the carboxylic reduction of the fatty acid radicals in an essentially saturated fatty oil. No. 2,062,950. Raymond E. Thomas, Newburgh, N. Y., to du Pont, Wilmington, Del.

Process for preparing formylamino anthraquinones. No. 2,063,027. Edwin C. Buxbaum, Shorewood, Wis., to du Pont, Wilmington, Del.

Compounds of the anthraquinone series. No. 2,063,028. Edwin C. Buxbaum, Shorewood, and Henry R. Lee, South Milwaukee, Wis., to du Pont, Wilmington, Del.

Ether alcohol esters of alicyclic carboxylic acids. No. 2,063,144. Harold J. Barrett, Wilmington, and Emmette F. Izard, Elsmere, Del., to du Pont, Wilmington, Del.

Process of producing n-aralkyl aminophenols. No. 2,063,151. Miles A. Dahlen and Richard G. Clarkson, Wilmington, Del., and Martin E. P. Friedrich, Carneys Point, N. J., to du Pont, Wilmington, Del.

Naphthalene derivatives. No. 2,063,211. Max Wyler and Robert William Kersey, Blackley, Manchester, Eng., to Imperial Chemical Industries, Ltd., Gt. Brit.

Manufacture of oil-soluble phenols by condensing a light coal tar distillate with a phenol in the presence of dilute mineral acid condensing agent. No. 2,063,212. Charles P. Wilson, Jr., Houston, Tex.

Naphthalene polycarboxylic acid derivative and process for preparing the same. No. 2,063,286. Max Wyler, Blackley, Manchester, Eng., to Imperial Chemical Industries, Ltd., Gt. Brit.

Process for manufacturing monocarboxylic acids. No. 2,063,365. Courtney Conover, to Monsanto Chem. Co., both of St. Louis.

Triisopropyl-naphthalene-beta-sulfonic acid compounds and their preparation. No. 2,063,416. Henry J. Weiland, South Milwaukee, and Milton A. Prahl, Milwaukee, to du Pont, Wilmington, Del.

Halogenated anthraquinone compounds. No. 2,063,420. William Dettwyler, Milwaukee, to du Pont, Wilmington, Del.

Naphthoic acid xylidides and their production. No. 2,063,590. Miles Augustinus Dahlen, Wilmington, Del., and Martin Edwin Friedrich, Carneys Point, N. J., to du Pont, Wilmington, Del.

Condensation products of aromatic diazo compounds with organic compounds containing a reactive carbonyl group. No. 2,063,631. Maximilian Paul Schmidt, Wiesbaden-Biebrich, and Rudolf Zahn, Wiesbaden, Ger., to Kalle & Co. A. G., Wiesbaden-Biebrich, Ger.

Dianthraquinonyl dicarboxylic acids and their preparation. No. 2,063,634. Cecil Shaw, Grangemouth, Scotland, to Imperial Chemical Industries, Ltd., Gt. Brit.

Light sensitive layers comprising the diazo compound of an acylaminoarylamine, said aryl being of the benzene series containing as the acid residue a thioglycol acid residue. No. 2,063,832. Georg Werner to Kalle & Co. A. G., both of Wiesbaden-Biebrich, Ger.

Polybasic aliphatic acid-polyhydric alcohol resin. Nos. 2,063,854 and 2,063,855. Israel Rosenblum, Jackson Heights, N. Y.

Amino derivatives of aromatic ketones and method of making same. No. 2,063,868. Edgar C. Britton and Lyman Heindel, Midland, Mich., and Fred Bryner, Yreka, Calif., to The Dow Chemical Co., Midland, Mich.

Reaction products of amines with strong polybasic mineral acids. No. 2,063,963. Heinrich Ulrich, Paul Koerding, and Joseph Nuesslein, Ludwigshafen-on-the-Rhine, Ger., to I. G., Frankfort, Ger.

Amino carboxylic acid condensation products. No. 2,063,987. Henry Dreyfus, London, Eng.

Hydroxy alkoxy derivatives of 2-phenylquinoline-4-carboxylic acid and method of making same. No. 2,064,297. Paul Diedrich, Finkenkrug, Ger., to Schering-Kahlbaum, A. G., Berlin, Ger.

Preparation of thiazthionium chlorides. No. 2,064,315. Wendell P. Munro, Bound Brook, and Hans Z. Lecher, Plainfield, N. J., to The Calco Chemical Co., Bound Brook, N. J.

Preparation of arylamides of furoylacetic acid. No. 2,064,331. Frithjof Zwilgmeyer to du Pont, both of Wilmington, Del.

Preparation of organic disulfides from compounds containing sulfydryl groups. No. 2,064,395. Eduard Tschunkur and Hugo Köhler, Cologne-Mulheim, Ger., to I. G., Frankfort, Ger.

Method of refining crude benzol containing water so as to make a motor fuel. No. 2,064,055. Clifford Banta, Englewood, N. J., to The Barrett Co., N. Y. City.

Method of producing phthalic anhydride in a finely divided form. No. 2,064,468. Harold B. Foster, Williamsville, N. Y., to National Aniline & Chemical Co., N. Y. City.

Method of treatment of coumarone indene resins to obtain hollow discrete particles. No. 2,064,487. Stuart P. Miller, Englewood, N. J., to The Barrett Co., N. Y. City.

Thiazyl derivatives. Nos. 2,064,782, 2,064,783 and 2,064,784. Howard I. Cramer, Cuyahoga Falls, Ohio, to Wingfoot Corp., Wilmington, Del.

Production of organic amino compounds. No. 2,064,797. Hermann Holsten, Ludwigshafen-on-the-Rhine, Ger., to I. G., Frankfort, Ger.

Coatings

Method of coating pipe. No. 2,061,825. Edwin P. Bly to International Bitumen Emulsions Corp., both of San Francisco.

Fatty substances as protective coatings for pencil cores. No. 2,062,074. Georg Wagner, Nuremberg, Ger.

Wrapping tissue containing a material to absorb certain light wavelengths. No. 2,062,179. Archibald Stuart Hunter, Kenmore, N. Y., to du Pont, Wilmington, Del.

Enamel for coating beer containers consisting of blown asphalt and gilsonite in proportions of two to one dissolved in carbon tetrachloride. No. 2,062,234. Samuel Clifford Robison, Syracuse, to Continental Can Co., N. Y. City.

Process for finishing wood and metal surfaces which comprises applying a pyroxylin enamel and allowing to dry and then applying a clear polymerized methyl methacrylate lacquer. No. 2,063,078. Harold J. Barrett to du Pont, both of Wilmington, Del.

Film forming composition containing 20% casein, 75 to 10% water and 5 to 70% sulfonated castor oil. No. 2,063,134. Frank G. Uhler, Newburgh, N. Y., to du Pont, Wilmington, Del.

Method of making blue colored vitreous enamels. No. 2,063,252. Charles J. Kinzie, Niagara Falls, N. Y., to The Titanium Alloy Mfg. Co., N. Y. City.

Method of hardening photographic gelatin emulsions and gelatin solutions by causing them to react with a diketone. No. 2,063,351. Cyril J. Staud and Richard M. Briggs, Rochester, N. Y., to Eastman Kodak Co., Jersey City, N. J.

Varnish agent containing a water-soluble salt of the reaction products of ammonium rosin and maleic acid. No. 2,063,541. Carleton Ellis, Montclair, N. J., to Ellis-Foster Co., N. J.

Hard finished protective coating for pipes, etc., composed of substantially equal parts of silica and sulfur and a small amount of rubber. No. 2,063,835. Marcus K. Billson to Hawaiian Hume Concrete Pipe Co., both of Honolulu, Territory of Hawaii.

Composition containing a cellulose derivative which on evaporation of the solvent leaves a glossy, transparent and heat sealable film. No. 2,064,292. William Hale Charch, Buffalo, to du Pont, Wilmington, Del.

Method of producing a weathered bronze coating on articles of copper and copper alloys. No. 2,064,301. John R. Freeman, Jr., Cheshire, and Rollo L. Hungerford, Waterbury, Conn., to The American Brass Co., Waterbury, Conn.

Method of protecting magnesium, aluminum or their alloys against corrosion by liquid hydrocarbons. No. 2,064,325. Hubert Sutton and Laurence Francis Le Brocq, South Farnborough, Eng.

Printer's blanket which comprises a layer of rubber and a flexible coating of a stabilized rubber hydrohalide to protect the rubber. No. 2,064,780. William C. Calvert, Cuyahoga Falls, Ohio, to Wingfoot Corp., Wilmington, Del.

Dyes, Stains, etc.

Conversion products of azo dyestuffs and their production. No. 2,061,545. Jakob Bosshart and Fritz Dobler to J. R. Geigy A. G., all of Basel, Switz.

Disazodyestuffs. No. 2,061,551. Heinrich Clingestein, Cologne, and Werner Petzold and Ludwig Hauck, Leverkusen, Ger., to General Aniline Wks., N. Y. City.

Copper and chromium containing acid monoazo dyestuffs. No. 2,062,547. Karl Wiedemann, Leverkusen-I. G.-Werk, Heinrich Clingestein, Cologne-on-the-Rhine, Hans Krzikalla, Ludwigshafen-on-the-Rhine, and Walther Kuehne, Mannheim, Ger., to General Aniline Wks., N. Y. City.

Method of drying certain diazo compositions containing a diazonium compound in combination with a metal halide by mixing with partially dehydrated crystallized magnesium sulfates. No. 2,062,873. Lawrence H. Flett, Hamburg, N. Y., to National Aniline & Chemical Co., N. Y. City.

Vat dye printing paste comprising a water soluble polyhydric alcohol and a substance of the group consisting of anthraquinone carboxylic acids and alkali metal salts thereof. No. 2,063,147. Hermann Berthold, Leverkusen-on-the-Rhine, Ger., to General Aniline Wks., N. Y. City.

Asymmetric indigoid-thioindigoid colors. No. 2,063,161. Emeric Havas, Pitman, N. J., to du Pont, Wilmington, Del.

Anthraquinone dyestuffs. No. 2,063,246. Norman Hulton Haddock and Frank Lodge, Blackley, Manchester, Eng., to Imperial Chemical Industries, Ltd., Gt. Brit.

Method of rotproofing materials containing cellulose fibers by impregnating with an azo dyestuff containing at least two nitro groups in its molecule. No. 2,063,272. Fritz Siefert and Hans Kaemmerer, Mannheim, Ger., to General Aniline Wks., N. Y. City.

Dyestuffs of the pyrene series and process of preparing them. No. 2,063,568. Heinrich Vollmann, Frankfort-on-the-Main-Hochst, and Hans Becker, Hofheim (Taunus), Ger., to General Aniline Wks., N. Y. City.

Water-insoluble azo dyes and their production. No. 2,063,589. Miles Augustinus Dahlen, Wilmington, Del., and Martin Edwin Friedrich, Carneys Point, N. J., to du Pont, Wilmington, Del.

Sulfuric acid esters of indanthrone. No. 2,063,594. David Alexander Whyte Fairweather, Falkirk and John Thomas, deceased, late of Polmont, Scotland, by Olive Morgan Thomas, Wilmslow, Eng., and Barclays Bank, Ltd., Manchester, Eng., executors, to Imperial Chemical Industries, Ltd., Gt. Brit.

Triphenylmethane dyestuffs. No. 2,064,258. Hans Grotowsky, Krefeld-Uerdingen, Ger., to General Aniline Wks., N. Y. City.

Method of dyeing using an alkaline paste containing chloro-methylbenzene-azo-carboxy-piperidine, 4-ethoxy-furoyl-acetanilide, ethylene-glycol-mono-ethyl-ether, a thickener, and water. No. 2,064,332. Frithjof Zwilgmeyer to du Pont, both of Wilmington, Del.

Explosives

Wrapping for explosives consisting of aluminum foil and paper cemented together with a waterproof adhesive. No. 2,061,558. Millard Brandt, Tamaqua, Pa., to Atlas Powder Co., Wilmington, Del.

Track torpedo consisting of potassium chlorate, finely divided carbonaceous material, granular abrasive material and nitrocellulose. No. 2,061,854. Louie A. Sherman, Florissant, Mo., to Safety Torpedo Corp., St. Louis, Mo.

Explosive containing a porous regenerated cellulose and a liquid sensitizer. No. 2,062,011. George M. Norman, Wilmington, Del., and Charles D. Bitting, Kenvil, N. J., to Hercules Powder Co., Wilmington, Del.

Process for producing firm, low density, cohesive pellets of black blasting powder. No. 2,062,636. Clarence W. Brooks, Jr., Woodbury, N. J., and Charles R. Johnson, West Chester, Pa., to du Pont, Wilmington, Del.

Pelleted blasting powder having high strength and low density consisting of black powder and ammonium nitrate and it may also contain a low density carbonaceous material. No. 2,062,666. William E. Kirst, Woodbury, N. J., to du Pont, Wilmington, Del.

Process of preparing explosive charges. No. 2,063,572. Clifford A. Woodbury, Media, and Philip G. Wrightsman, Chester, Pa., to du Pont, Wilmington, Del.

Process of manufacturing gelatin dynamite composition. No. 2,064,581. Fred R. Wilson, Birmingham, Ala., to du Pont, Wilmington, Del.

Fine Chemicals

Process for producing direct positives for autotype purposes from a line copy of halftone. No. 2,061,688. Gustav Wilmanns, Wolfen, Dreis Bitterfeld, and Gerhard von Kujawa, Dessau in Anhalt, to I. G., Frankfort, Ger.

Preparation of a cementitious product by intergrinding a dry cementitious material and an oleaginous substance in the presence of chlorine. No. 2,061,774. Hans M. Olson, Fallbrook, Calif.

Preparation of antioxidants. No. 2,061,779. Waldo L. Semon, Silver Lake Village, Ohio, to The B. F. Goodrich Co., N. Y. City.

Engraving process. No. 2,062,023. Walter Howey, N. Y. City.

Removal of bichromated colloid films containing glue from lithographic printing surfaces by treatment with an aqueous solution containing an alkaline earth chloride and an alkaline earth hydroxide. No. 2,062,273. Robert F. Reed, Paul W. Dorst and Anthony George, Cincinnati, to The Lithographic Technical Foundation, N. Y. City.

Method of extraction of morphine and its related derivatives from raw materials. No. 2,062,324. George Elwood Mallory, Takoma Park, Md., to The Government of The United States.

Method of sterilizing liquids under a vacuum. No. 2,062,330. Walter Page, Scarsdale, and Burt E. Taylor, Mt. Vernon, N. Y., to The Borden Co., N. Y. City.

Preparation of coumarin by heating a mixture consisting of dichlor ortho cresol carbonate, acetic anhydride and one of the group consisting of oxides, carbonates and chlorides of zinc, bismuth, and cobalt. No. 2,062,364. Gustave Dretchmar and Charles Collaud, Geneva, Switz., to Givaudan-Delawanna, N. Y. City.

Manufacture of cyclic ethers of polyhydric alcohols. No. 2,062,404. Henry Dreyfus, London, Eng.

Process for manufacturing flavanthrone from antimony pentachloride and beta-amino-anthraquinone. No. 2,062,450. Frederick L. English, Carneys Point, N. J., to du Pont, Wilmington, Del.

Polyhydric alcohol esters. No. 2,062,918. Walter E. Lawson, Woodbury, N. J., to du Pont, Wilmington, Del.

Preparation of aliphatic sulfo-ethers. No. 2,062,957. Alfred William Baldwin, Ashton-on-Mersey, and Anthony James Hailwood, Altrincham, Eng., to Imperial Chemical Industries, Ltd., Gt. Brit.

Ether compounds. No. 2,062,958. Alfred William Baldwin, Sale, and Anthony James Hailwood, Altrincham, Eng., to Imperial Chemical Industries, Ltd., Gt. Brit.

Process for producing cyclic terpene alcohols by the saponification of esters of cyclic terpene alcohols in the presence of a saponifying alkali. No. 2,063,162. Clyde O. Henke, Wilmington, Del., and Gastao Etzel, Pitman, N. J., to du Pont, Wilmington, Del.

Hydroxy phenyl morpholines. No. 2,063,191. Horace B. Pray to du Pont, both of Wilmington, Del.

Method of rendering immune to sulfurization the sodium thiosulfate crystals contained in a powdered composition adapted for making up a photographic fixing bath. No. 2,063,297. John I. Crabtree and Harold D. Russell, Rochester, N. Y., to Eastman Kodak Co., Jersey City, N. J.

Method of separating and recovering an organic acid ester from its reaction mixture. No. 2,063,322. Carl J. Malm and Charles R. Fordyce, Rochester, N. Y., to Eastman Kodak Co., Jersey City, N. J.

Method of making a colored photographic image. No. 2,063,348. Merrill W. Seymour, Rochester, N. Y., to Eastman Kodak Co., Jersey City, N. J.

Isothiourea-isopropylether. No. 2,063,461. Bruno Puetzer, Albany, N. Y., to Winthrop Chem. Co., N. Y. City.

Salts of acridinium bases and their preparation. No. 2,063,865. Max Bockmühl and Leonhard Stein, Frankfort, Ger., to Winthrop Chemical Co., N. Y. City.

Glass, Ceramics

Safety glass consisting of two sheets of glass and an interposed sheet of a cellulose plastic bonded together with a reaction product formed by treating a cellulose acetate solution with a depolymerizing agent dissolved in a plasticizer. No. 2,062,541. Roy W. Wampler, to Libbey-Owens-Ford Glass Co., both of Toledo, Ohio.

Method of glazing ceramic ware by subjecting glazed ware at the glazing temperature to furnace gases containing phosphorus pentoxide. No. 2,063,953. Gordon R. Pole, Florence, Ala., to Tennessee Valley Authority, Wilson Dam, Ala.

Colored optical glass comprising compounds of lead, manganese and cerium. No. 2,064,361. Murray R. Scott to Bausch & Lomb Optical Co., both of Rochester, N. Y.

Industrial Chemicals, Apparatus, etc.

Manufacture of aliphatic acids, anhydrides, and ketones. No. 2,061,615. Henry Dreyfus, London, Eng.

Apparatus for purifying oil. No. 2,061,660. Louis P. Kamosis, Detroit, Mich.

Continuous process for the nitration of glycerine. No. 2,061,728. Frederick Alexander Ferrier Crawford, West Kilbride, and William Arthur Percival Challenor, Ardrossan, Eng., to Imperial Chemical Industries, Ltd., Gt. Brit.

Continuous process for distilling alcohol from alcohol-yielding sulfuric-acid liquors. No. 2,061,810. William H. Shiffler and Melvin M. Holm, Berkeley, Calif., to Standard Oil Co. (Calif.) (Delaware), San Francisco.

Method of producing tin tetrachloride from tin and chlorine. No. 2,061,816. Paul L. Tyson to General Chemical Co., both of N. Y. City.

Conversion of drying oils to non-drying oils. No. 2,061,829. Ben S. Buckmaster to Donolac Corp., both of Chicago.

Catalyst consisting of a metal deposited on a ceramic base. No. 2,061,848. Barney S. Radcliffe, Oak Park, Ill.

Process for separating methylamines from mixtures containing them and ammonia. No. 2,061,889. Chester E. Andrews, Brookline, and LeRoy U. Spence, Philadelphia, to Röhm and Haas Co., Philadelphia.

Artificial composition obtained by condensing a polymerized vinyl alcohol with an alpha-halogenalkyl ether. No. 2,061,946. Erich Kuehn, Mannheim, and Heinrich Hopff, Ludwigshafen-on-the-Rhine, Ger., to I. G., Frankfort, Ger.

Production of silica brick from salvaged silica refractory material. No. 2,062,005. Russell Pearce Heuer, Bryn Mawr, Pa., to General Refractories Co.

Manufacture of minus 100 mesh monocalcium phosphate from a lime base and strong phosphoric acid. No. 2,062,064. William H. Knox, Jr., and Robert T. Cochran, Nashville, Tenn., to Victor Chemical Works, Ill.

Removal of magnetic impurities from feldspar by grinding followed by magnetic separation. No. 2,062,072. Norman G. Smith, Brunswick, and Stanton G. Smith, Auburn, Maine.

Preventing blooming of roofing granules by coating them with sodium silicate, burning, and treating with dilute nitric acid. No. 2,062,080. Stephen G. Wright, Chicago.

Apparatus for recovery of phosphorus vapors by condensation. No. 2,062,091. Stapleton D. Gooch, Pembroke, Fla.

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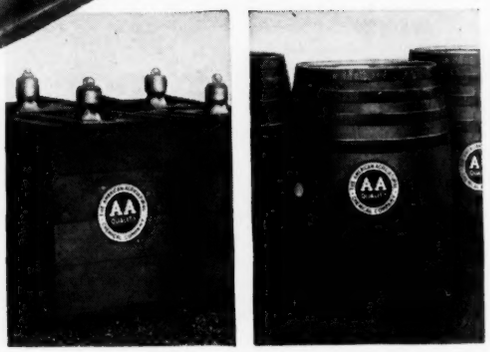

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Process for producing titanium dioxide pigment of rutile crystal form. Nos. 2,062,133 and 2,062,134. Paul Kubelka, Prague, and Josef Srbek, Aussig, Czechoslovakia, to du Pont, Del.

Production of colored titanium dioxide pigments by calcining titanium dioxide and hydrated titanium dioxide with compounds of the chromium-vanadium group. No. 2,062,137. Robert M. McKinney and Carlton E. Smith, Linthicum Heights, Md., to du Pont, Del.

Dispersible carbon black containing 1-10% of an absorbed naphthenate of a metal of the group consisting of magnesium, calcium, barium, and strontium. No. 2,062,159. Alfred A. Brizzolara, N. Y. City, Edwin L. Duhring, Plainfield, and Archibald M. Erskine, Chatham, N. J., to du Pont, Del.

Method of preventing injury to match striking surface consisting of red phosphorus, nitrocellulose and acetone during drying of the surface. No. 2,062,191. Rodney Southwick Pullen, Akron, Ohio, to Pullenlite Co., Philadelphia.

Apparatus for setting and drying the paste in storage battery plates. No. 2,062,193. Edward W. Smith and Clarence A. Hall to The Electric Storage Battery Co., all of Philadelphia.

Production of m-alkyl-ethers of protocatechuic aldehyde. No. 2,062,205. Friedrich Boedecker, Dahlem, Ger., and Hans Volk, Tempelhof, Ger.

Process for manufacture of pigments conjointly with alkali metal hydroxide by the reaction of a causticizing agent and a causticizable alkali metal salt in the presence of water. No. 2,062,255. Arthur Minard Brooks and Harold Robert Rafton, Andover, Mass., to Raffold Process Corp., Mass.

Manufacture of alkyl phosphates by reacting phosphoric acid with a gaseous olefinic hydrocarbon in the presence of sulfuric acid and under superatmospheric pressure. No. 2,062,312. Vladimir Ipatieff to Universal Oil Products Co., both of Chicago.

Process for manufacture of carbon black from a hydrocarbon gas. No. 2,062,358. Per K. Frolich, Roselle, N. J., to Standard Oil Development Co., Del.

Production of microcrystalline carbon on a clean carbon base by subjecting it to aliphatic hydrocarbon gas saturated with water vapor at temperatures from 800° to 1500° C. No. 2,062,370. Henry J. Miller, Maplewood, N. J., to Radio Corp. of America, Del.

Manufacture of essentially dry alkali metal alkyl sulfates by reacting alkyl hydrogen sulfates with dry alkali metal halides. No. 2,062,454. Clyde O. Henke and William H. Lockwood to du Pont, all of Wilmington, Del.

Method of improving the absorbent properties of absorbent materials by treating with a compound from the group consisting of 2-chlor-5-hydroxy-toluene and 4-chlor-1-hydroxy-3-5-dimethyl benzene. No. 2,062,504. Cecil Chapman, Pinner, Eng., to Monsanto Chemicals, Ltd., London, Eng.

Method of making pulverized borax glass. No. 2,062,505. Frederick W. Corkill, Los Angeles, Calif., to Pacific Coast Borax Co., Nev.

Method of separating gases by freezing. No. 2,062,537. Lee S. Twomey, Vista, Calif.

Method of making paste electrolytes. No. 2,062,543. Herbert Waterman, Wantagh, N. Y., to Aerovox Corp., Brooklyn.

Production of non-crystalline borax from hydrous borax. No. 2,062,650. Henry D. Hellmers to West End Chemical Co., both of West End, Calif.

Production of fluorine containing carbon compounds by reacting together hydrogen fluoride and a carbon compound containing at least one acyclic carbon atom having attached thereto at least one hydrogen atom and one halogen other than fluorine. No. 2,062,743. Herbert Wilkens Daudt and Mortimer Alexander Youker, to Kinetic Chemicals, all of Wilmington, Del.

Mixture of lecithin and a diglyceride of a higher fatty acid which is readily dispersible in aqueous media. No. 2,062,782. Albert K. Epstein and Benjamin R. Harris, Chicago.

Process for preventing the discoloration of mixtures of fatty acid and substances which normally discolor them during distillation. No. 2,062,837. Madison L. Sheely, Des Plaines, Ill., to Armour and Co., Chicago.

Method of treating wood with arsenic sulfide. No. 2,062,877. Joseph L. Goodale, Ipswich, Mass.

Insulating composition containing from 70% to 90% magnesium silicate and the remainder chiefly alkaline earth metal oxide compounds and clay. No. 2,062,914. Edgar Kunstmann, Berlin-Heinersdorf, to Steatit-Magnesia A. G., Berlin-Pankow, Ger.

Apparatus for continuously producing blocks of high density solid carbon dioxide. No. 2,062,971. Theophil Eichmann, Bern-Liebefeld, Switz., to International Carbonic Engineering Co., Kennett Square, Pa.

Heat insulating composition containing by volume ratio, 0.8 to 1.3 clay, 1.5 to 2.5 waste hemp fines, 4.5 to 8.0 balsa wood fine particles, 1.2 to 2.2 milled paper, 1.2 to 2.5 asbestos. No. 2,062,996. Johannes Leppik to Telsit Insulation Corp., both of N. Y. City.

Process for producing iron phosphate by reacting liquors containing dilute iron sulfate and mineral acid solutions with tri-calcium phosphate. No. 2,063,029. John H. Coleman, Elizabeth, N. J., and Francis H. Coleman, Blairsville, Pa.

Voltaic cell. No. 2,063,070. Gunnar A. F. Winckler, Worcester, Mass., to Winckler Eng. Lab., Inc., Boston.

Fused salt bath containing alkali metal cyanide and a meta-silicate for carburizing ferrous metals at temperatures below incipient fusion. No. 2,063,079. Walter Beck, Frankfort, and Klaus Bonath, Cronberg-in-Taunus, Ger.

Method and apparatus for controlling pH. No. 2,063,140. Donald K. Allison, Los Angeles.

Fused refractory composition composed of chromite ore, iron oxide and alumina. No. 2,063,154. George J. Easter and Charles McMullen to The Carborundum Co., all of Niagara Falls, N. Y.

Process for the recovery of organic constituents from black liquor. No. 2,063,177. Ralph H. McKee, N. Y. City.

Method of utilizing waste carbon dioxide gas. No. 2,063,201. Roy W. Smith, Newark, Ohio.

Yellow to red pigments comprising basic lead chromate and at least one basic salt of lead with one of the acids from the class consisting of molybdic and tungstic acids. No. 2,063,254. Ekbert Lederle, Ludwigshafen-on-the-Rhine, Ger., to I. G., Frankfort, Ger.

Method of making oxidation catalysts from iron, magnesium and chromium oxides and sodium silicate. No. 2,063,302. James F. Eversole, Charleston, W. Va., to Union Carbide and Carbon Corp., N. Y.

Process for controlling hydrogen ion concentration of butyl alcohol fermentation mashes. No. 2,063,448. David A. Legg and Hugh R. Stiles to Commercial Solvents Corp., all of Terre Haute, Ind.

Process for controlling hydrogen ion concentration of butyl alcohol fermentation mashes. No. 2,063,449. David A. Legg to Commercial Solvents Corp., both of Terre Haute, Ind.

Production of ethyl alcohol and acetone by fermentation. No. 2,063,450. David A. Legg to Commercial Solvents Corp., both of Terre Haute, Ind.

Process for reacting caustic lime and gypsum so as to cause the heat of reaction to calcine the gypsum and the water of liberation to hydrate the caustic lime. No. 2,063,488. Parker C. Choate, Essex, and Amos K. Hobby, Canton, Mass.

Removal of rust and scale from ferrous surfaces by immersion in a sulfuric acid solution having a concentration of 60% or greater at a temperature of 100° C. and then washing with water before electrodepositing zinc on the cleaned article. No. 2,063,529. Urlyn Clifton Tainton and Frank W. Harris, Baltimore, Md., said Harris assignor to said Tainton.

Production of refractory bricks. No. 2,063,543. Konrad Erdmann, Radenthein, Carinthia, Austria.

Treatment of fluid hydrocarbons, under carbon forming conditions, in metallic vessels lined with a metallic coating prepared by decomposing within the vessel a vaporized compound of the metal, in order to lessen the carbon formation. No. 2,063,596. Paul Feiler, Ludwigshafen-on-the-Rhine, Ger., to I. G., Frankfort, Ger.

Method of inhibiting the deterioration of animal and vegetable fats and oils on storage. No. 2,063,602. James K. Hunt and George H. Latham to du Pont, all of Wilmington, Del.

Esters of the thio acids of phosphorus. No. 2,063,629. Paul L. Salzberg, Wilmington, and James H. Werntz, Marshallton, Del., to du Pont, Wilmington, Del.

Use of an aliphatic lactone as a selective solvent in the separation and recovery of acetylene from a gas mixture. No. 2,063,680. Robert M. Isham, Okmulgee, Okla., to Danciger Oil and Ref., Inc., Tulsa, Okla.

Method of extinguishing oil tank fires by projecting aqueous solutions containing a high concentration of a compound of an alkali metal element of group I of the periodic table of elements having high fire-extinguishing properties. No. 2,063,772. Charles A. Thomas and Carroll A. Hochwalt to The Fyr-Fyter Co., all of Dayton.

Use of sodium meta-phosphate in the cooling fluid of internal combustion engines in order to increase the heat transfer coefficient. No. 2,063,788. Robert E. Burk to Standard Oil Co. (Ohio), both of Cleveland.

Siccative metal salts and method of using them. No. 2,063,838. Herman A. Bruson, Elkins Park, and Otto Stein, Lansdowne, Pa., to The Resinous Products & Chemical Co., Philadelphia.

An ammonia-soluble siccative composition comprising an unsaturated organic acid reaction product with tung oil and an unsaturated organic acid reaction product with rosin. No. 2,603,869. Carleton Ellis, Montclair, N. J., to Ellis-Foster Co., N. J.

Process for the manufacture of an ether of a chlorhydrin by reacting a polyhydric alcohol with hydrogen chloride. No. 2,063,891. Henry Dreyfus, London, Eng.

Process and apparatus for making carbureted water gas. Nos. 2,064,005, 2,064,006 and 2,064,008. Charles H. Hughes, Glen Ridge, N. J., to Semet-Solvay Eng. Corp., N. Y. City.

Carbureted water gas set. No. 2,064,007. William Tiddy, Scarsdale, N. Y., to Semet-Solvay Eng. Corp., N. Y. City.

Tank for aging cellulosic solutions prior to their manufacture into artificial silk filaments. No. 2,064,076. Adrian J. L. Moritz to American Enka Corp., both of Enka, N. C.

Molded desiccant comprising a hydrated oxide of boron having less H_2O than orthoboric acid and associated with a porous inert carrier. No. 2,064,113. Ralph V. Heuser, Mount Vernon, N. Y.

Hydration of olefines using a catalyst containing as its essential component a metaphosphate of a metal from the class consisting of iron and aluminum. No. 2,064,116. George Frederick Horsley, Norton-on-Tees, Eng., to Imperial Chemical Industries, Ltd., Gt. Brit.

Apparatus and process for continuously liming and carbonating sugar-juices. No. 2,064,135. Raymond M. White, Denver, Colo.

Lead-in conductor comprising an exterior tube of deoxidized copper and a filler comprising a mixture of manganese oxide, graphite and plaster of Paris. No. 2,064,184. Elbridge W. Stevens, Baltimore, Md.

Method of producing higher ketones by contacting an aliphatic alcohol with a lower ketone in the presence of a mixed catalyst having hydrogenating and dehydrating characteristics. No. 2,064,254. Otto Fuchs, Frankfort, Erich Naujoks, Berlin-Zehlendorf Mitte, and Wilhelm Querfurth, Mainz-Mombach, Ger.

Method and apparatus for synthesizing nitrogen compounds. No. 2,064,260. Ludwig Herrmann to Kurt Adamczick and Willy List, all of Frankfort, Ger.

Crystalline anhydrous borax. No. 2,064,337. Leroy G. Black to American Potash & Chemical Corp., both of Trona, Calif.

Preparation of 2.3-butylene glycol by fermenting a carbohydrate mash with a suitable bacteria culture. No. 2,064,359. Marinus Adrianus Scheffer to N. V. Nederlandsche Gist-en-Spiritusfabriek, both of Delft, Netherlands.

Method of chlorinating saturated aliphatic hydrocarbons containing three or more carbon atoms. No. 2,064,413. Lee H. Clark, Grosse Ile, Mich., to The Sharples Solvents Corp., Philadelphia.

Process and reagent for desalting crude oils and breaking water in oil emulsions. No. 2,064,541. Paul R. Hershman, Chicago.

Preparation of monomethylol ketones from para-formaldehyde and slightly alkaline anhydrous ketone solution. No. 2,064,564. William M. Quattlebaum, Jr., Charleston, W. Va., to Union Carbide and Carbon Corp., N. Y.

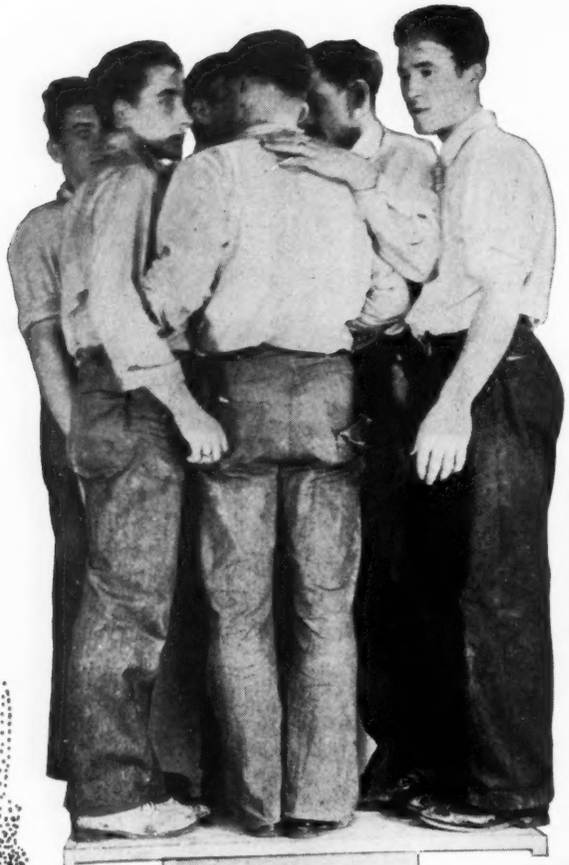
Method of fractionating without polymerization solutions of styrol containing chlorine as an impurity. No. 2,064,571. Omar H. Smith, West Englewood, N. J., to U. S. Rubber Co., N. Y. City.

Process of producing a lime composition containing 1 to 30% sulfur. No. 2,064,588. Charles I. Chubbuck, San Marino, Calif.

Stabilization of non-drying and semi-drying oils. No. 2,064,610. James K. Hunt to du Pont, both of Wilmington, Del.

An electrical humidity indicator containing a resistance composed of various hygroscopic materials. No. 2,064,651. Marcus E. Fiene, Ballston Lake, N. Y., to G. E., N. Y.

Process of reacting olefines with sulfuric acid. No. 2,064,667. Kenneth B. Lacy, Highland Park, Ill., to Van Schaack Bros. Chemical Wks., Chicago.



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Process for the manufacture of stable preparations having a high content of commercial lecithin. No. 2,064,727. Carl Heinz Buer, Cologne-Marienburg, Ger.

Colloidal sulfur suspension in a medium containing water, an alkali and at least 40% glycerin. No. 2,064,728. William S. Calcott, Penns Grove, and Ira Williams, Woodstown, N. J., and Benton Dales, Wilmington, Del., to du Pont, Wilmington, Del.

Method of making plasterboard. No. 2,064,800. Hans O. Kauffmann and Dean D. Crandell to Buffalo Electro-Chemical Co., all of Buffalo.

Leather

Treatment of leatherboard with an acid non-oxidizing agent to overcome the effect of iron-tannate inks produced during its manufacture. No. 20,184, Herman William Richter to Geo. O. Jenkins Co., both of Bridgewater, Mass.

Process of finishing leather by treating with a compound selected from the group consisting of the hygroscopic hexahydric alcohols and the water soluble, hygroscopic, anhydro derivatives of the hexahydric alcohols. No. 2,063,337. James T. Power to Atlas Powder Co., both of Wilmington, Del.

Process of impregnating leather with India rubber. No. 2,064,073. Alexander McLennan, Chesterfield, Eng., to Oscar Cecil Hartridge, London, Eng.

Metals and Alloys

Electrolytic deposition of metals. No. 2,061,554. Jean Billiter, Vienna, Austria, to Copperweld Steel Co., Glassport, Pa.

Process for electroplating from an electrolyte composition containing an aqueous solution of an ironizable compound of the metal to be plated out and sufficient starch to make a gel. No. 2,060,592. Felix R. Rapids, Chicago.

Silver alloy consisting of 70-80 parts silver, 6-12 parts copper, 8-18 parts cadmium and 1-2 parts cobalt. No. 2,061,624. Childress B. Gwyn, Jr. to P. R. Mallory & Co., both of Indianapolis.

Alloy which may have its hardness removed for machining and then have it restored. No. 2,061,648. John W. Bolton, Hamilton, and Sylvester A. Weigand, to The Lunkenheimer Co., all of Cincinnati.

Apparatus for making powdered metals. No. 2,061,696. Jean Hubert Louis De Bats, East Orange, N. J.

Apparatus for treating dry and finely divided ore. No. 2,061,698. Archibald Ewart to Ralph M. Welch of one-half, both of Chicago.

Corrosion resistant tube containing 5% nickel, 3% aluminum, 3% tin, and the balance copper. No. 2,061,897. Donald K. Crampton, Marion, and Newell W. Mitchell, Waterbury, Conn., to The Chase Co.'s, Waterbury, Conn.

Dezincification resistant brass tube containing copper, zinc, tin, aluminum, and antimony. No. 2,061,921. Edward W. Roath, Waterbury, Conn., to The Chase Co.'s, New Haven, Conn.

Process for refining alloys of lead and tin. Nos. 2,061,994 and 2,061,995. Jesse O. Betterton and Yurii E. Lebedeff, Metuchen, N. J., to American Smelt. and Ref. Co., N. Y. City.

Process for desilverizing antimony-bearing alloys of tin and lead by addition of aluminum-zinc alloy to a molten bath to remove the antimony and enable the zinc to react on the silver. No. 2,062,116. Jesse O. Betterton and Yurii E. Lebedeff, Metuchen, N. J., to American Smelt. and Ref. Co., N. Y. City.

Heat treatable nickel-base alloys containing up to 2.5% beryllium and 0.5 to 10% titanium. No. 2,062,130. Werner Hessenbruch to Heraens-Vacuumschmeize, A. G., both of Hanau-on-the-Main, Ger.

Thermally treated aluminum-copper alloy free from magnesium, containing 2-12% copper and 0.005 to 0.1% tin, remainder being aluminum. No. 2,062,329. Joseph A. Nock, Fr., Tarentum, Pa., to Aluminum Co. of America, Pittsburgh, Pa.

Method and apparatus for producing aluminum electrolytically. No. 2,062,340. Victor M. Weaver, Niagara Falls; Ida Shur Weaver Administratrix of said Victor M. Weaver, deceased.

Alloy containing 70 to 90% copper, 0.25 to 1% tin, 0.15 to 0.5% phosphorus and remainder zinc. No. 2,062,427. Harold L. Pierson, Torrington, to The American Brass Co., Waterbury, Conn.

Alloy having high tensile strength and ductility and consisting of copper with 2.5%-3.25% silicon, 0.5%-1.25% tin and 0.01% to 0.60% magnesium. No. 2,062,448. Louis S. Deitz, Jr., Metuchen, N. J., and Hanley H. Weiser, Pleasant Plains, N. Y., to Nassau Smelt. and Ref. Co., N. Y. City.

Welding electrode consisting of a ferrous metal core coated with a composition containing 10%-25% silicon dioxide and 15% to 40% ilmenite. No. 2,062,457. Robert S. Johnston, Yardley, Pa., to John A. Roebling's Sons Co., Trenton, N. J.

Formation of electrodes of a filming metal by polarizing them in an electrolyte consisting solely of an aqueous solution of boric acid. No. 2,062,464. Julius Edgar Lilienfeld, Winchester, Mass.

Method of making pyrophoric flints. No. 2,062,486. Charles H. Van Dusen, Jr., Cleveland Heights, and Edwin C. Dietrich, East Cleveland, Ohio, to Cooper Sparkelite, Ltd., Dover, Del.

Method of forming compound strips comprised of a layer of iron and steel and a layer of plastic bronze. No. 2,062,795. Robert D. Pike, Diablo, to Kalif Corp., Emeryville, Calif.

Method of casting aluminum base alloys containing 4% to 15% magnesium in green sand molds by bringing ammonium fluoride in contact with the molten metal next to the mold. No. 2,062,818. Roy E. Paine, Cleveland, to Aluminum Co. of America, Pittsburgh.

Method for reducing the copper content of antimonial lead. No. 2,062,838. Ray C. Skow, Metuchen, N. J., to American Smelt. and Ref. Co., N. Y. City.

Insulating castings composed of magnesia and aluminum in substantially equal proportions by weight. No. 2,062,962. Henry N. Baumann, Jr., and John P. Swentzel, Niagara Falls, N. Y., and Ian M. Logan, Niagara Falls, Ontario, Can., to The Carborundum Co., Niagara Falls.

Rivets of ingot steel alloy containing up to 0.13% carbon, up to 0.5% manganese, 0.35% to 0.5% silicon, up to 1% copper, up to 1% molybdenum and up to 1% vanadium. No. 2,062,966. Herbert Buchholtz, Dortmund, Ger.

Method of heat treating aluminum alloys containing from 3 to 16% magnesium to improve the corrosion resistance. No. 2,063,022. Adolf Beck, Bitterfeld, Ger., to I. G., Frankfort, Ger.

Method of heat treating aluminum base alloys containing from 3 to 12% magnesium and 2 to 6% zinc in order to increase the corrosion resistance. No. 2,063,023. Adolf Beck, Bitterfeld, Ger., to I. G., Frankfort, Ger.

Thermocouple element formed from an alloy composed entirely of nickel, copper and molybdenum. No. 2,063,097. Otto Hermann, St. Louis, Mo.

Arc welding electrode consisting of a ferrous core covered with a woven fabric and a coating consisting of slip clay, an alkaline earth carbonate, ferrochrome, carbonaceous material, rutile silica and ferro-manganese. No. 2,063,182. Wilber B. Miller, Flushing, N. Y., to Union Carbide and Carbon Corp., N. Y.

Method of electrodepositing chromium by electrolyzing at 35° C. or higher an aqueous bath comprising chromic acid, a sulfate radical or its equivalent, and boric acid in amount approximating saturation. No. 2,063,197. Richard Schneidewind, Ann Arbor, Mich., one-tenth to U. S. Navy.

Nickel-chromium-iron alloy containing 20 to 50% nickel, 5 to 25% chromium, 0.01 to 0.5% zirconium, 0.01 to 1.0% aluminum, and the balance iron. No. 2,063,513. James M. Lohr, Morristown, N. J., to Driver Harris Co., Harrison, N. J.

Bath and process for electrodeposition of chromium. No. 2,063,760. Joseph Schulein, Rockford, Ill.

Process of decomposing beryllium minerals. No. 2,063,811. Gustav Jaeger, Neu-Isenburg, Ger., to Deutsche Gold und Silber Scheideanstalt vormals Roessler, Frankfort, Ger.

Ferrous base pistons for internal combustion engines having a coating of aluminum, magnesium, or their mixtures condensed thereon. No. 2,063,904. David Julian Block, Winnetka, Ill.

Heat treated and artificially aged aluminum base alloy containing 2 to 12% copper, 0.005 to 0.1% tin, 0.01 to 0.15% cadmium and 0.005 to 0.03% magnesium as an impurity. No. 2,063,942. Joseph A. Nock, Jr., Tarentum, and Hertha R. Freche, New Kensington, Pa., to Aluminum Corp., Pittsburgh.

Flotation method of concentrating minerals. No. 2,064,031. Oliver C. Ralston, Clarkdale, Ariz., to Phelps Dodge Corp., N. Y. City.

Alloy containing from 38 to 42% titanium, 8 to 12% silicon, not to exceed 5% aluminum, 0.01 to 0.12% carbon, and the balance iron. No. 2,064,150. George F. Comstock, Niagara Falls, N. Y., to The Titanium Alloy Mfg. Co., N. Y. City.

Zinc plating anode containing as a principal component zinc and in addition a small percentage of nickel. No. 2,064,307. George B. Hogaboom, New Britain, Conn., to Hanson-Van Winkle-Munning Co., Matawan, N. J.

Process for making manganese chrome steel. No. 2,064,441. George P. Messenger to Kensington Steel Co., both of Chicago, Ill.

Method of sintering preroasted zinc concentrates containing cadmium. No. 2,064,479. Stuart H. Levison, Forest Hills, N. Y., and Emil J. Bruderlin, Amarillo, Tex., to American Smelt. & Ref. Co., N. Y. City.

Method and apparatus for recovering vaporized metal compounds. No. 2,064,495. Augustin Leon Jean Queneau, Bernardsville, N. J.

Process for extracting metal compounds from ores containing manganese carbonates and compounds of other metals. No. 2,064,551. John D. MacCarthy, Chamberlain, S. Dak., to General Manganese Corp., Detroit.

Paper and Pulp

Method of rendering paper sensitive to ink eradicating chemicals by incorporating a 1-amino-5-chloro-benzo-thiazole. No. 2,061,632. Samuel Lenher to du Pont, both of Wilmington, Del.

Production of coated creped paper. No. 2,061,748. Edward H. Angier, to Angier Laboratories, both of Framingham, Mass.

Method of adding alum to furnish a containing acid reactive filler in a process for making paper. No. 2,062,442. John Campbell, Glens Falls, N. Y., to International Paper Co., N. Y. City.

Manufacture of transfer paper such as carbon paper by introduction of stearine into the paper pulp, then manufacturing the paper from the pulp and coating the paper with a copying ink. No. 2,063,226. Roger Braunstein to Société Anonyme des Anciens Etablissements Braunstein Frères, both of Paris, France.

Petroleum and Petroleum Chemicals

Fibrous material impregnated with isobutylene polymers. No. 2,061,570. Per K. Frolich, Roselle, and Peter J. Wiezevich, Elizabeth, N. J., to Standard Oil Development Co., Del.

Refining petroleum hydrocarbon oils by thermal treatment in the presence of phosphoric acid and a phenol compound. No. 2,061,583. William M. Malisoff, Philadelphia, and Fred G. Hess, Lansdowne, Pa., to The Atlantic Refining Co., Philadelphia.

Pyrolytic conversion of methane to benzene. No. 2,061,597. Harold M. Smith, Peter Grandone, and Harry T. Rall, Bartlesville, Okla.

Pyrolytic process for obtaining ethylene from natural gas. No. 2,061,598. Harold M. Smith and Peter Grandone, Bartlesville, Okla.

Method of reactivating hydrocarbons to increase the gasoline yield. No. 2,061,792. Sylvester Dayson, Baird, Tex.

Process for cracking oil. No. 2,061,820. Joseph G. Alther to Universal Oil Products Co., both of Chicago.

Cracking and coking process for hydrocarbon oils. No. 2,061,833. Gustav Egloff and Alfred Fisher to Universal Oil Products Co., all of Chicago.

Process for cracking hydrocarbons with a molten metal. No. 2,061,836. Wayne A. S. Harmon, Los Angeles to George C. Peckham.

Process for removing sulfur from hydrocarbons by treating with hydrogen. No. 2,061,845. Jacque C. Morrell to Universal Oil Products Co., both of Chicago.

Production of useful products from unsaturated polyhalides. No. 2,062,002. Herbert P. A. Groll, Oakland, and George Hearne, Berkeley, Calif., to Shell Development Co., San Francisco.

Oxazine and phenoxazine to inhibit gum formation in cracked petroleum distillates. No. 2,062,201. Thomas W. Bartram, Nitro, W. Va., to Monsanto Chemical Co., St. Louis, Mo.

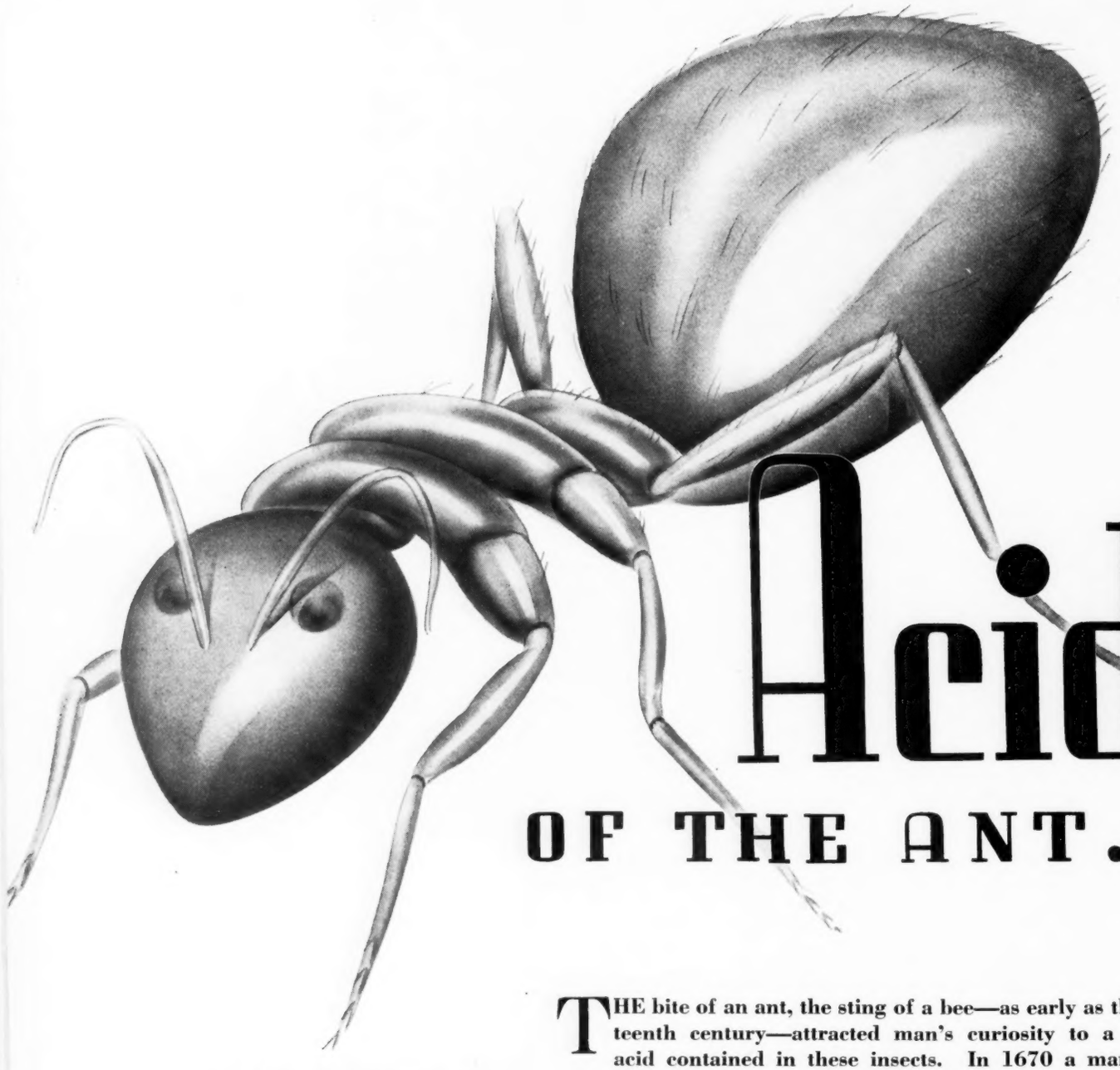
Method of coking hydrocarbon liquids. No. 2,062,254. Harold V. Atwell, White Plains, N. Y., to Gasoline Products Co., Newark, N. J.

Method for fractionation of oil. No. 2,062,266. Leo D. Jones, to The Sharples Specialty Co., both of Philadelphia.

Manufacture of aliphatic acid halides by reacting a member of the group consisting of carbon monoxide, phosgene and carbonyl sulfide with halogenated lower aliphatic hydrocarbons in the presence of a catalyst. No. 2,062,344. Peter J. Wiezevich and Per K. Frolich, Elizabeth, N. J., to Standard Oil Development Co., Del.

Process of purifying sludge formed by the treatment of petroleum hydrocarbons with sulfuric acid. No. 2,062,347. Francis M. Archibald, Elizabeth, N. J., to Standard Oil Development Co., Del.

Composition for coating solid carbonaceous fuel consisting of an aqueous solution containing 2-25% water soluble salts of sulfuric acid derived from an acid sludge of a nitrogenous base petroleum oil. No. 2,062,350. Egnar W. Carlson and Peter J. Wiezevich, Elizabeth, N. J., to Standard Oil Development Co., Del.



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Crystallization inhibitor for paraffin wax in lubricating oils. No. 2,062,354. Garland H. B. David, Baton Rouge, La., to Standard Oil Development Co., Del.

Removal of wax and asphalt from petroleum oil by dissolving the oil in a liquid tertiary alcohol at a temperature adequate to cause solution and subsequent chilling to precipitate the wax and asphalt. No. 2,062,355. Carleton Ellis, Montclair, N. J., to Standard Oil Development Co., Del.

Process for separating oil from slack wax. No. 2,062,356. Warren D. Farr and Frank B. Samuel, Baton Rouge, La., to Standard Oil Development Co., Del.

Production of asphalts with a low susceptibility to temperature change. No. 2,062,366. Charles Mack, Sarnia, Ontario, Canada, to Standard Oil Development Co., Del.

Method for cooling and granulating asphalt. No. 2,062,374. Henry M. Noel, Paris, Fra., to Standard Oil Development Co., Del.

Method of distilling low boiling hydrocarbons at low temperatures to prevent cracking and polymerization. No. 2,062,375. John W. Packie, Green Village, and Daniel E. Stines, Plainfield, N. J., to Standard Oil Development Co., Del.

Use of boron fluoride and boron fluoride dissolved in sulfuric acid to remove gum forming constituents, sulfur compounds, etc., from naphtha. No. 2,062,377. Helmuth G. Schneider, Elizabeth, N. J., to Standard Oil Development Co., Del.

Stabilizer for low boiling light colored petroleum distillates consisting of an aryl amine of the class consisting of alpha naphthylamine and phenyl hydrazine. No. 2,062,675. James B. Rather and Leslie C. Beard, Jr., Brooklyn, and Orland M. Reiff, Jackson Heights, N. Y., to Socony-Vacuum Oil Co., N. Y. City.

Process for depressing the pour point of hydrocarbon oils. Nos. 2,062,676 and 2,062,677. Orland M. Reiff, Woodbury, N. J., to Socony-Vacuum Oil Co., N. Y. City.

Process for refining mineral oils. No. 2,062,733. George J. Strezynski, Poughkeepsie, N. Y., to The DeLaval Separator Co., N. Y. City.

Process for separating mineral oils containing liquid paraffinic and naphtheric hydrocarbons into fractions No. 2,062,872. Seymour W. Ferris, Aldan, Pa., to The Atlantic Refining Co., Philadelphia.

Process for purifying insulating and lubricating oils by forcing them under high pressure through minute orifices into an evacuated chamber. No. 2,062,933. Paul B. Renfrew to S. F. Bowser & Co., both of Fort Wayne, Ind.

Process for removing moisture and gases from oils by forcing them under high pressure through capillaries into an evacuated chamber. No. 2,062,934. Paul B. Renfrew to S. F. Bowser & Co., both of Fort Wayne, Ind.

Apparatus for use in oil distillation. No. 2,063,072. Joseph G. Alther, to Universal Oil Products Co., both of Chicago,

Process for refining hydrocarbon oil to remove color and reduce the gum and sulfur content. No. 2,063,082. Roland B. Day to Universal Oil Products Co., both of Chicago.

Hydrocarbon oil conversion process. No. 2,063,112. Jacque C. Morrell to Universal Oil Products Co., both of Chicago.

Process for removing sulfur, gum and color forming constituents from hydrocarbon oils. No. 2,063,113. Jacque C. Morrell to Universal Oil Products Co., both of Chicago.

Process for the pyrolytic conversion of hydrocarbon oils. No. 2,063,114. Jacque C. Morrell to Universal Oil Products Co., both of Chicago.

A solvent extraction process for obtaining maximum yields of high viscosity index oils from a mixture of paraffinic and naphthenic components in a wax-bearing lubricating stock. No. 2,063,369. Sterling H. Diggs and James M. Page, Jr., Casper, Wyo., to Standard Oil Co. (Ind.), Chicago.

Process for refining hydrocarbon oil by treating the oil with added aqueous hydrogen chloride in the presence of solid zinc chloride. No. 2,063,491. Roland B. Day to Universal Oil Products Co., both of Chicago.

Process for refining cracked hydrocarbon vapors by treating the vapors with added hydrochloric acid and a water solution of a mercury salt in the presence of a contact mass containing a solid metallic salt. No. 2,063,494. Gustav Egloff and Jacque C. Morrell to Universal Oil Products Co., all of Chicago.

Process for hydrocarbon oil conversion. No. 2,063,505. Lyman C. Huff to Universal Oil Products Co., both of Chicago.

Process for the stabilizing of gasoline by the addition of up 2% of a compound having the phthalic acid radical and selected from the group consisting of phthalides, phthalic acid and phthalic anhydride. No. 2,063,516. Jacque C. Morrell to Universal Oil Products Co., both of Chicago.

Process for refining cracked hydrocarbon distillates by treatment at high temperatures with added aqueous hydrogen chloride in the presence of a copper salt in aqueous solution and in solid form. No. 2,063,517. Jacque C. Morrell and Gustav Egloff to Universal Oil Products Co., all of Chicago.

Process for refining hydrocarbon vapors by treatment with aqueous hydrogen chloride, an aqueous solution of a zinc salt and a solid zinc salt. No. 2,063,518. Jacque C. Morrell and Gustav Egloff to Universal Oil Products Co., all of Chicago.

Method of decolorizing and degumming cracked petroleum oils. No. 2,063,522. Rudolph C. Osterstrom, Kenilworth, Ill., to Pure Oil Co., Chicago.

Process for the solvent fractionation of a mixture of hydrocarbons. No. 2,063,564. John C. Stauffer to Standard Oil Company (Ind.) both of Chicago.

Dispersion of phenolphthalein in mineral oils by dissolving the phenolphthalein in normal butanol before adding to the oil. No. 2,063,575. Elmer Wade Adams, Hammond, Ind., to Standard Oil Co. (Ind.), Chicago.

Method of producing high antiknock motor fuel from a motor fuel stock containing a substantial amount of olefinic hydrocarbons boiling in the range of 250° to 400° F. No. 2,063,597. Ogden Fitz Simons and Frank Cutshaw Croxton, Hammond, Ind., to Standard Oil Co. (Ind.), Chicago.

Production of lubricating oils from waxy materials in a single operation in the presence of a dehydrogenating catalyst. No. 2,063,623. Mathias Pier, Heidelberg, and Ernst Donath, Mannheim, Ger., to I. G., Frankfort, Ger.

Lubricating oil comprising in combination a hydrocarbon oil and a small quantity of a halogenated terpene. No. 2,063,857. Waldo L. Steiner, Ponca City, Okla., to The Lubri-Zol Development Corp., Cleveland.

Process of refining lubricating oil with an alkali metal. No. 2,063,860. Justin F. Wait, N. Y. City.

Process of refining petroleum oil with a molten mass containing an alkali metal. Nos. 2,063,861 and 2,063,862. Justin F. Wait, N. Y. City.

Lubricating oil comprising in combination a hydrocarbon oil and a small amount of a halogenated hydroaromatic compound. No. 2,063,880. Bert H. Lincoln, Ponca City, and Alfred Henriksen, deceased, late of Ponca City, Okla., by Ellen M. Henriksen, administratrix, Ponca City, Okla., to The Lubri-Zol Development Corp., Cleveland.

Method of increasing the yield of gasoline in the cracking process and removing gum forming constituents by subjecting the vapors to the action of a solid calcined mixture of siliceous material and phosphoric acid. No. 2,063,933. Vladimir Ipatieff to Universal Oil Products Co., both of Chicago.

Solvent extraction of oils. No. 2,064,338. Arthur B. Brown, Hammond, Ind., and Fred F. Diwoky, Chicago, to Standard Oil Co. (Ind.), Chicago.

Process and apparatus for the continuous and counter-current treatment of mineral oils with a solvent. No. 2,064,422. Merrell R. Fenske and Wilbert B. McCluer, State College, Pa., to Pennsylvania Petroleum Research Corp., Pa.

Method of dewaxing a mineral wax bearing oil. No. 2,064,506. Charles C. Towne, Poughkeepsie, N. Y., to The Texas Co., N. Y. City.

Process of treating an acid-oil sludge containing objectionable acidic sulfur compounds. No. 2,064,549. Carl E. Lauer, Port Arthur, Tex. Robert E. Manley, Beacon, N. Y., and Henry D. Loeb, N. Y. City to The Texas Co., N. Y. City.

Removal of sulfur compounds from hydrocarbons. No. 2,064,558. Avery A. Morton, Watertown, Mass.

Method for cracking hydrocarbon oils. No. 2,064,708. Robert E. Wilson to Standard Oil Co. (Ind.), both of Chicago.

Method of coking heavy hydrocarbon oil. No. 2,064,715. Harold V. Atwell, White Plains, N. Y., to Gasoline Products Co., Newark, N. J.

Process for stabilizing hydrocarbons. No. 2,064,757. Percival C. Keith, Jr., Peapack, N. J., to Gasoline Products Co., Newark, N. J.

Method of preparing a gaseous hydrocarbon fuel having a distinctive and penetrating odor. No. 2,064,805. William H. Hampton and John T. Rutherford, Berkeley, Calif., to Standard Oil Co., (Calif.), San Francisco.

Resins, Plastics, etc.

Urea-formaldehyde plastics. No. 2,061,543. Rene Armenault, Paris, Fr., one-half to Fabriques de Produits de Chimie Organique de Laire, Issy, Fr.

Purification of alkyd resins. No. 2,061,635. Kurt Sandig, Zwickau, Ger., to The Resinous Products & Chemical Co., Philadelphia.

Manufacture of resin bonded abrasive articles. No. 2,061,931. Raymon C. Benner, Osborne L. Mahlman, Kenmore, and Walter D. Rossow, to The Carborundum Co., all of Niagara Falls.

Manufacture from leatherboard and various gums and resins of a laminated article exhibiting striated color variations. No. 2,061,951. Joseph F. Pollard to Brackett Mfg. Co., both of Newburyport, Mass.

Production of flexible veneer from synthetic resin films. No. 2,062,088. John F. Dreyer, Cincinnati, Ohio, to The Formica Insulation Co., Ohio.

Production of crystalline products by condensing urea and formaldehyde. No. 2,062,171. Nathaniel Fuchs, Linden, N. J., to Plaskon Co., Del.

Production of diacetyl from a vinyl compound. No. 2,062,263. Ernst Eberhardt, Ludwigshafen-on-the-Rhine, Ger., to I. G., Frankfort, Ger.

Method of applying cloth decorations to cloth by using a cellulose xanthate-thermoplastic resin adhesive. No. 2,062,336. Roy W. Sexton, Wytheville, Va., to The Parfek, Inc., Del.

Solvent for resins. No. 2,062,378. William Seaman, Glens Falls, N. Y., to Standard Oil Development Co.

Extrusion mix composed of plasticized vinyl acetal resin and a solvent composed partially of methyl alcohol, butanol and water. No. 2,062,750. Elmer H. Haux, Tarentum, to Pittsburgh Plate Glass Co., Allegheny County, Pa.

Preparation of resins from unsaturated petroleum hydrocarbons. No. 2,062,845. Charles A. Thomas and William H. Carmody, to Monsanto Petroleum Chemicals, both of Dayton.

Preparation of hydrogenated nitrogen-containing resins. No. 2,063,158. Crawford H. Greenewalt to du Pont, both of Wilmington, Del.

Synthetic resin varnish containing a condensation product of liquid esters resulting from the esterification of a polybasic aromatic acid, partly with a polyhydric and partly with a monohydric alcohol. No. 2,063,239. Charles L. Gabriel, Lawrence, N. Y., to Resinox Corp., N. Y. City.

Synthetic resin varnish containing a neutral liquid glycol phthalate obtained by completely esterifying phthalic acid with a glycol of the group consisting of ethylene glycol and 1, 3-butylene glycol. No. 2,063,240. Charles L. Gabriel, Lawrence, N. Y., to Resinox Corp., N. Y. City.

Preparation of cast resins. No. 2,063,315. Glen M. Kuettel, Roselle, N. J., to du Pont, Wilmington, Del.

Modified natural resin adapted for use in coating compositions which comprises the reaction product of rosin and maleic acid. No. 2,063,540. Carleton Ellis, Montclair, N. J., to Ellis-Foster Co., N. J.

Resinous product formed by simultaneous reaction of natural resin, an alpha-beta unsaturated organic polybasic acid and a polyhydric alcohol. No. 2,063,542. Carleton Ellis, Montclair, N. J., to Ellis-Foster Co., N. J.

Process of making a cellulose acetate compatible resin by the interaction of alpha-terpineol and a member of the group consisting of maleic anhydride and maleic acid. No. 2,063,837. Herman A. Bruson, Germantown, Pa., to The Resinous Products & Chemical Co., Philadelphia.

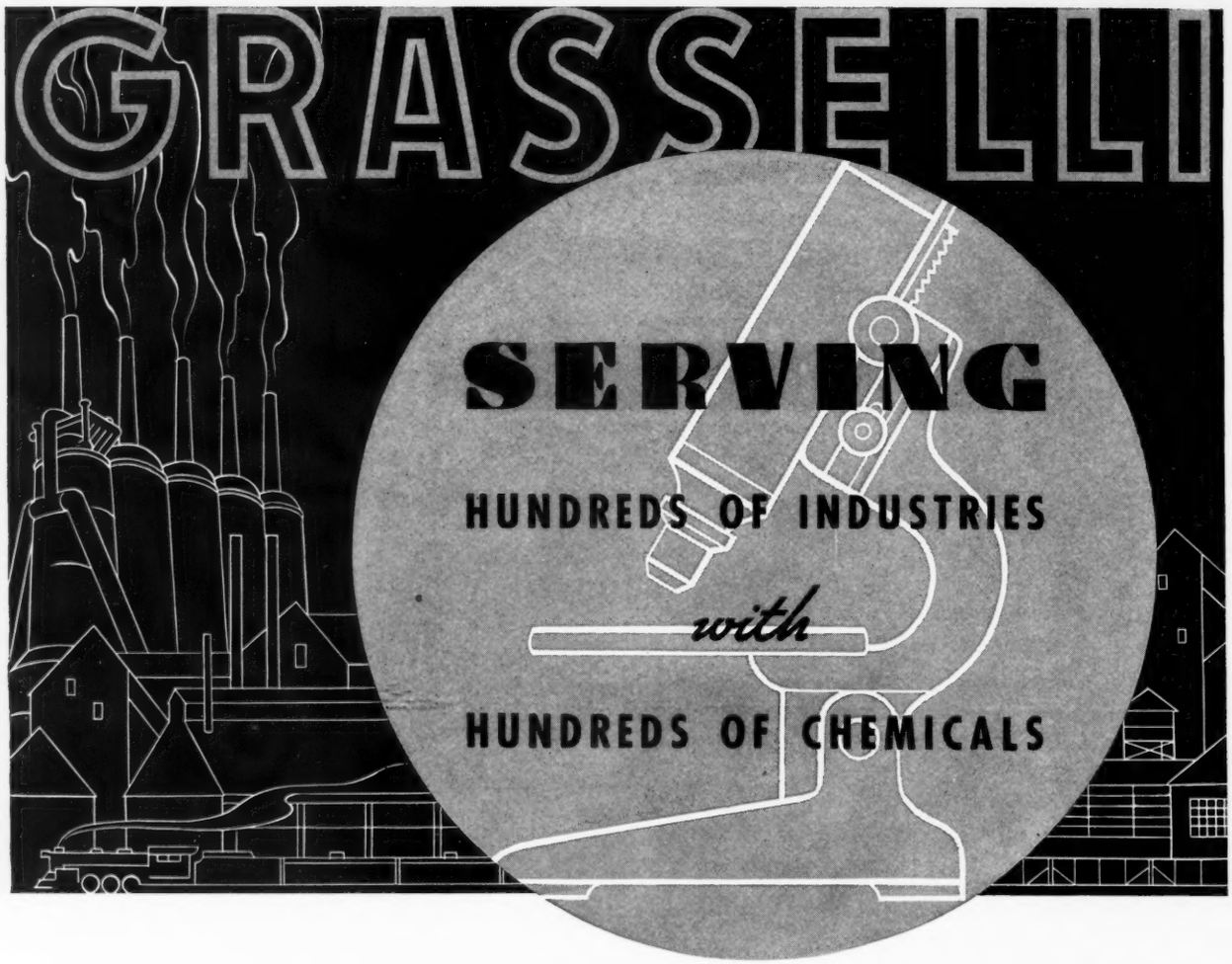
Resin formed by the reacting of glycerol and succinic acid. No. 2,063,856. Israel Rosenblum, Jackson Heights, N. Y.

Plastic setting mass adapted for use as coating and sizing compositions, etc., containing casein, a solubilizing agent for casein, and an alkali-metal metaphosphate. No. 2,064,387. Charles Schwartz to Hall Laboratories, Inc., both of Pittsburgh.

Process for producing vinyl resins, a preponderating proportion of which is insoluble in toluene. No. 2,064,565. Ernest W. Reid, Pittsburgh, Pa., to Union Carbide and Carbon Corp., N. Y.

Preparation of a resin by reacting an alkaline phenol formaldehyde partial condensate with a coumarone-indene resin in the presence of a polyhydric alcohol. No. 2,064,614. Earle C. Kneale and Henry H. Wohlgemuth, Pontiac, Mich.

Drying oil composition consisting of a drying oil and a substantially pure p-dihydroxy diphenyl ethane. No. 2,064,786. Harry M. Dent, Buffalo, N. Y., to General Plastics, Inc., North Tonawanda, N. Y.



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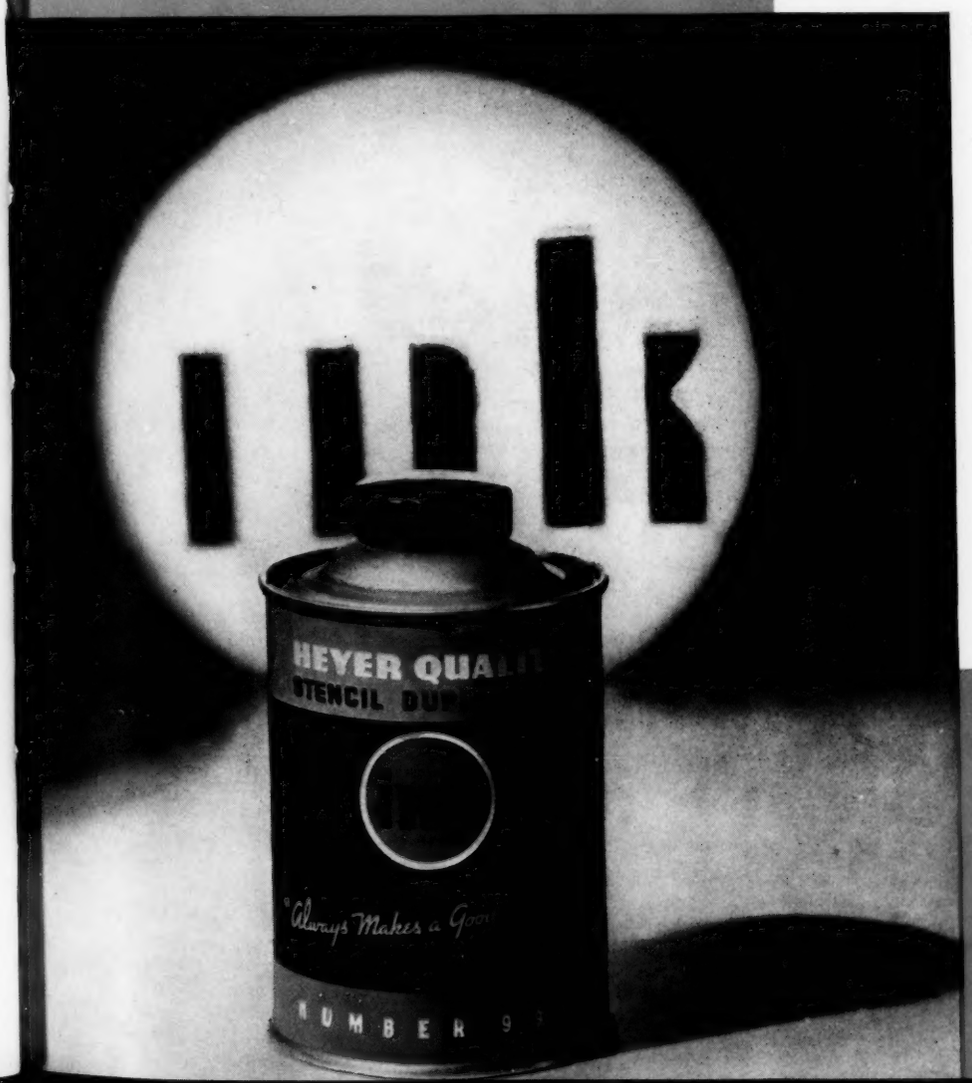

Heyer Duplicator Ink packaged in Phoenix Cone Top Cans. Heatfield-Tillou photo.

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Soap and Soap Compounds for the Metal Industries

By Benjamin Levitt

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SOAP and compounds combined with soap have manifold uses in metal working and finishing. Their uses may be divided as follows: 1. Metal cutting; 2. Metal forming; 3. Wire drawing; 4. Burnishing; 5. Cleaning before plating; 6. Finishing and polishing.

The following requirements must be met in cutting metal: 1. The tool must be kept cool enough so that it keeps in proper temper. 2. The metal being cut must be given sufficient lubrication so that the cut shall come clean, without undue scoring. 3. The compound must be such that its emulsion remains uniform while in use, and that it cools the metal and tool sufficiently without itself volatilizing and so becoming decomposed. (In many cases, liquid cutting compounds are recirculated over the work.) 4. It must not oxidize or gum, nor should it froth.

Cutting compounds must be formulated for the special work they are expected to do, taking into account, also, the kind of metal to be cut, and the temperature requirements. Here is an example of a soluble oil cutting compound: Though seemingly it contains no soap, it does in fact contain the soap formed in the finishing process of sulfonating the castor oil, and also that produced by the interaction of ammonia and red oil.

15%	Sulfonated castor oil (75% grade)
15	Oleic acid (red oil)
10	No. 1 Lard oil
60	Light mineral oil

Method: Heat the oils to 110° F. and add ammonia until a good emulsion is produced when a few drops of the compound are added to water. Add also one-half per cent. cresylic acid as an antiseptic.

As a further guide in formulating, Federal Specification VVO 261 for Soluble Cutting Oil is cited, which sets forth the following limits and tests: Water content 10%; Ash content 3.5%. To 45 cc. water, add 15 cc. oil, and stir at 1500 r.p.m. for 5 minutes. Allow to set for 15 minutes. There must remain no bubbles on the surface (absence of froth). After 24 hours, there must be no visible separation of the emulsion. It must not corrode.

Since the manufacturer must know something about the *modus operandi* of his product, the suggestions of the General Motors Corp. are given: To one part of oil, allow

For drilling 20-50 parts of water
For turning and boring 20-25 parts of water
For threading 6-20 parts of water
For grinding 30-70 parts of water
For cold saws 10-35 parts of water
For broaching and gear hobbing 5-20 parts of water

For further examples of cutting oils, the reader is referred to an article on Industrial Soaps, by this author, in the May 1936 issue of CHEMICAL INDUSTRIES, pp. 506-7.

Metal Forming

Metal forming compounds are used for slushing onto the metal sheet when it is placed into a press for the purpose of shaping into hollow ware, auto fenders, bodies, etc. The compound must give lubrication to the die sufficient to impart smoothness to the shaped metal, without scoring and overheating which would weaken the metal and also dull the die.

A compound used in forming brass, may be formulated as follows:

Tallow	7%
Palm oil	14
Caustic soda 25Bé.	16
Mineral oil 200 Vis.	28
Water	35

The tallow and palm oil are saponified with caustic soda, the mineral oil is then added slowly with constant stirring, and lastly, the water is mixed in.

Wire Drawing

Wire drawing and burnishing are the two processes in the metal industry that require actual soap in large tonnage. In wire drawing the soap acts as a lubricant for the die. In general there are two methods for drawing wire—the wet and the dry process. In the wet process, a solution of the soap is used.

When much heat is evolved in drawing, a high titre soap is employed. A whole boiled soap made of palm oil and caustic soda serves this purpose well. This soap is usually sold as an almost anhydrous powder or chip.

For some wire drawing purposes fig soaps are preferred. These are soft soaps made of potash and vegetable oils. They produce solutions which do not jell in cold, and so may be piped from a central reservoir to each wire drawing machine.

A typical soap of this kind would be—

50 Pounds soya bean oil
22 Pounds 47 Bé. potash
28 Pounds water

Method: The oil and water are charged into a jacketed steam-heated kettle, and heated to 150° F. Small portions of the lye are added and boiled in, while stirring continuously. This will yield an amber colored transparent soap paste. It should make a clear solution in distilled water if completely saponified.

Dry wire drawing is sometimes accomplished by means of metallic soaps. Aluminum stearate is said to prolong the life of the die and to impart smoothness and brightness to high carbon steel wire.

Burnishing

Burnishing is a process that is usually carried out in tumbling barrels. The pieces to be burnished are placed in the machine, with steel balls of various shapes and sizes, and a solution of soap is added. The whole is then tumbled until all the raw edges have been worn smooth. Plain tallow soap in powdered form is used for this purpose. In rare cases the soap may contain powdered pumice to assist the process. For jewelry novelties, etc., a solution of the above illustrated soft soap may be used for burnishing.

Cleaning Before Plating

Prior to plating, the fabricated metal must necessarily be cleansed of oxides, soot, fine metal and siliceous particles which adhere to the surface by means of mineral and saponifiable oils. Metal cleaning is a process similar in many respects to laundering. Though the cleaning solution does not actually penetrate through the metal as it does the interstices of a fabric, the im-

purities on the surface of the metal nevertheless must be removed as in washing a fabric.

Here, then, is a process in which we must emulsify mineral oil, solubilize fatty oil, dissolve oxides, float off metal and silica particles, and once having freed them from the surface of the metal, they must be so suspended in the solution as not again to be precipitated thereon. All this can be accomplished by a proper composition of cleaning materials.

Silicates of soda assist materially in suspending finely divided particles in a cleaning solution. Besides, they exert a buffering action so as to modify the effect of other alkalies on the metal. The action of sodium silicate in preventing the corrosion of aluminum is well known.

Trisodium phosphate is a very useful adjunct as an emulsifier for mineral oil. The following are two examples of such cleaners:

Soap	10%	Soda ash	60%
Sodium metasilicate	50	Caustic soda	30
Soda ash	40	Rosin	10
		The rosin is to be ground 20 mesh.	

Considerable cleaning before plating is done in an alkaline bath by means of electrolysis.

Buffing and Polishing

After plating, the metal must be buffed and polished. This is accomplished by means of polishing wheels made of leather or felt. A typical compound for use on the buffing wheel is represented by U. S. Patent No. 1,822,596, wherein 27 pounds of hide glue are soaked for one to two hours in 54 pounds of cold water. The glue is then dissolved by gentle heating on a water bath. The solution is then transferred to a suitable mixing vessel, and 45 pounds of diethylene glycol are added together with 300 pounds of 300 mesh powdered silica. After thorough mixing, the product is poured into suitable molds to set. After drying somewhat, the bars may be wrapped or covered with lacquer. A more plastic composition may be produced by adding 4½ pounds of tallow to the mixture before casting into bars. Suitable glue preservative and hardener such as formalin may be added.

One authority suggests the following buffing composition for polishing nickel:

Stearic acid	86%
Paraffin	16
Tallow	10
Japan wax	3
Silex	376

To make buffing compounds wash off easily, soap or sulfonated oil are sometimes added.

This brief sketch covers practically all the processes wherein soap or soap compounds are used in the metal industry, from the raw metal to the finished product, which may require merely a finishing lacquer before being placed on the market.

Organic Chemicals in Dry Cleaning

Synthetic organic chemicals of the aliphatic class—mono- and dihydric alcohols, and their related esters, amines, ethers, acids, ketones, etc.—certain of these products have proved valuable in the science of dry cleaning and textile detergents.

On mixing 140 parts triethanolamine with 282 parts oleic acid and stirring for a short time a soap, triethanolamine oleate, is formed by direct addition of the nitrogen atom without liberation of water. This soap is stable and a true organic soap freely soluble not only in water and alcohols, but in petroleum spirit, mineral oils and chlorinated solvents, without the customary and necessary considerable excess of free fatty acid in "benzine" soap.

Dry cleaning soaps may be prepared with triethanolamine as the base which have the following advantages: (1) They are freely soluble in dry cleaning spirit when from 80/100% saponified. This reduces to a minimum the retention of free fatty acid in the goods, and the disposition of such free acid to react with residual metals in textiles, such as those derived from tin-weighting of silk, or mordanting of dyes, leaving rancid deposits conductive to residual odors. (2) A very liberal modicum of water may be blended into the soaps capable of stable incorporation into dry cleaning spirit. This is known to promote detergent action, and in combination with a relatively strong soap addition has been proved by ample experience to increase the thoroughness of cleaning and to effect a substantial reduction in the tedious and expensive process of "spotting" of residual stains. (3) They are exceptionally well suited for operation in high pressure filter systems of cleaning and recovery. Strong soap solutions in dry cleaning spirit may be prepared with relatively low viscosities, and with an indefinitely wide range of permissible dilution without separation. This maintains the filters without clogging and without the accumulation of undue pressure for long periods.

These three desiderata impart great value to triethanolamine in dry cleaning soaps apart from facilitating easy and excellent workmanship. It should be borne in mind that in matters of cost, triethanolamine conveys economies in reducing the extent and necessity of "spotting," which is the dry cleaner's heaviest process cost; and in the simplification and reduction of wear in filtering operations.

Monoethanolamine is also capable of similar advantageous use in dry cleaning soaps, and, although slightly more expensive than triethanolamine, the lower combining weight ensures an aggregate saving. Another and still newer organic base which forms soaps freely soluble in oils is the di-acidic base ethylene diamine, which has the remarkably low combining weight of 30. Monoethanolamine and ethylene diamine are progressively stronger in alkalinity than triethanolamine.

By their strong surface tension-depressant effect and their property of solubility in both water and oils the triethanolamine soaps have emulsifying and dispersing characteristics of a high order. In general, triethanolamine may be used with fatty acids to emulsify simply and effectively an oil, fat or wax or derived composition. The strong emulsifying effect on mineral oils and greases finds effective application in carpet cleaning soaps and shampoos. The function here is not only one of thorough penetration, but also emulsification of residual mineral oils and greases deriving from the carpet manufacture. Digested by British *Chemical Age*, from a booklet issued by General Chemical & Metallurgical, Ltd.

Improving Sodium Silicate Adhesives

Sodium silicate adhesives are improved by the addition of salts of phosphoric acid, particularly primary and secondary calcium phosphates or a mixture of these, such as occurs in superphosphate. By varying the amount added the drying time of the adhesives can be greatly varied. Silicofluorides have been used in the past but superphosphate costs less, has greater efficiency, and is free from toxicity. In one example given in German Patent 625,203 (Henkel & Co., Dusseldorf), one kilog of ground quartz sand is mixed with 100 to 150 grams of finely powdered sodium silicate (ratio $Na_2O:SiO_2 = 1:3.4$), which contains about 18% of water, and 20 to 30 grams of superphosphate.

Coal Dust Laying Composition

English Patent 451,934, controlled by W. Warr, Stalybridge, Cheshire, England, discloses formula for a composition for laying dust and preventing explosions in coal mines consisting of mixing common salt or ammonium chloride with Epsom Salt, plus a wetting agent. Suggested formula is given: 10 lbs. of the salt mixture is dissolved in 10 lbs. of water to which is added one lb. of a wetting agent which has previously been added to one gal. of water. Amount will treat 60-100 lb. of coal dust.

Glycerin in Industrial Specialties

Part II

By Milton A. Lesser, B.Sc. and Georgia Leffingwell, Ph.D.

RAPID improvements in manufacture and finish of automobiles have required newer specialties. Glycerin is an indispensable ingredient. Winter driving, now so commonplace, led to the development of glycerin-alcohol anti-freeze solutions, and special windshield preparations to fight fog, rain, frost, and sleet. The following simple preparations meet these latter needs.

Windshield Cleaner

Alcohol (50%)	90
Glycerin	10

Frost Formation Preventer

Salt	1
Glycerin	16
Water	8

If the windshield is wiped occasionally with the cloth prepared as directed below the glass will not fog.

Water	5 qts.
Glycerin	1 oz.
Sodium Oleate	1 oz.

Boil together for five minutes, then immerse the cloth (usually flannel) in the boiling solution for ten minutes.

As a basic ingredient of the "glyptal" type resins, glycerin enters extensively into laminated automobile safety glass, replacing many unsatisfactory substances formerly used.

By adding a simple solution such as

Glycerin	4
Water	4
Oleic Acid	4

to the water in the radiator, leaks may be prevented or stopped.

A simple, inexpensive hydraulic brake fluid that is often recommended is made of equal parts of glycerin and denatured alcohol. The same fluid may be used for automatic door checks. Whole glycerin is often used in hydraulic jacks.

New automobile finishes require new polishes. The liquid and solid types employ glycerin. Sample formulae follow:

Automobile Liquid Polish

White Spirit	2½ pts.
Mineral Oil	2½ pts.
Turkey Red Oil	4 pts.
Ammonia	1 oz.
Water	1 pt.
Glycerin	1 pt.
Formaldehyde	8 oz.
Fuller's Earth	
Bentonite	

Mix the oils together, add the water, glycerin, and formaldehyde, stirring rapidly until a smooth mixture results. The type and quantity of abrasive to be used depends upon the type of polish desired. For a light, bright polish, use a mild grade of abrasive.

Solid Abrasive Wax Auto Polish

A.—Montan Wax Bleached	9 grams
Montan Wax Double Bleached	5 grams
Olein	2 cc.
B.—Potassium Carbonate	2 grams
Glycerin (28° Bé.)	3 cc.
Boiling Water	40 cc.
C.—Yellow Clay or Bentonite	to suit
D.—Turpentine Oil or White Spirit	22 cc.

Melt A, add boiling B with stirring, then C, cool and add D.

Cellulose friction polishes, made with glycerin, have the advantages of leaving no after-marking, wax films or other matter which attracts dust. However, if used too often this type of polish may wear away the finish, nor are they as waterproof as wax polishes.

As a lubricant, or as a constituent of special lubricants, glycerin is specially useful where oil cannot be used. In the processing and pumping of gasoline, oil lubricants soon dissolve. The following patented formula is typical of the special lubricants used.

Gasoline-Proof Lubricating Grease

Oleic Acid	2.5
Ammonium Linoleate	17.5
Glycerol	37
Lubricating Oil	35

A simpler, readily prepared lubricant of this type is this machine oil:

Oleic Acid	100
Glycerin	50

The setting-up and repair of gasoline and oil systems employs the special oil resistant glycerin-litharge cements. Glycerin likewise enters into the composition of oil-proof binders and packings.

Many processes and services, impossible in the home, are routine in the commercial laundry. In these procedures glycerin plays an important role. As in textile mills, detergents are important. Formulae and functions are the same. Among the specialty preparations, containing glycerin, used by laundrymen are marking inks, bluing pastes and fluids, starch glossers, rust, grease, scorch and difficult stain removers, rinse water, etc. Although glycerin enters into the composition of almost every type of ink the following fabric marking ink is of particular value in the laundry.

Copper Sulfate	20
Dextrine	11
Aniline Hydrochloride	30
Glycerin	6
Distilled Water	Sufficient

The copper sulfate and the dextrine are triturated together and mixed with the aniline, the glycerin is added and then the water to the consistency desired; stir constantly.

Gloss preparations to be used as an adjuvant with the starch are widely employed in the laundry, not only to lend a fine smooth finish, but also to prevent scorching and sticking of the iron. The following is a typical formula:

Acacia	1
Borax	2
Glycerin	1
Water	32

Soak the acacia in the water for six hours, add the borax, then heat to a boil and add the glycerin, let cool and strain. To use, add two ounces of this preparation to 3 quarts of the usual starch solution.

No better detergent exists than glycerin for treating difficult stains such as mustard, coffee, cocoa, etc., specially on delicately colored fabrics. Method is simple. Apply glycerin, preferably warmed, to the stain, let stand for one to two minutes, and then rinse with water.

Grease and other stains, not amenable to regular soaps, are treated with the following solution and then rinsed:

Glycerin	1 oz.
Alcohol	1 oz.
Ether	1 oz.
Ammonia	4 ozs.
Castile Soap	1 oz.

Mix in the order given, and add, with stirring, sufficient water to make two quarts.

A rust and ink spot remover is readily prepared, using the following:

Potassium Binoxalate	2
Water	88
Glycerin	11

Dissolve the potassium binoxalate in the water, add the glycerin and filter. When used, the rust or ink spot is well moistened with this solution. The material is allowed to lie for three hours, the moistened spot being rubbed frequently. Finally rinse well with water.

Lipstick stains are a constant source of trouble. The following formula, while not unfailing, will work in many instances.

Glycerin	1
Glacial Acetic Acid	1
Methyl Alcohol	3

(Rinse well after using)

Addition of one part of glycerin to 100 parts of the final rinse water will be found highly advantageous, specially for fine knit goods, as socks, silk stockings, and silk underclothes. This rinsing restores color and smoothness, qualities not lost after ironing. Rinsing woolens this way prevents harsh texture, and maintains the desirable softness. Laundries often clean rugs and carpets. The following formula is of interest.

Rug Cleaner

Coconut Oil Soap	12
Ammonia 28%	2.8
Glycerin	7.9
Water	77.3

Dissolve the soap in the water, add other ingredients.

Advisable is a test of a small inconspicuous portion of the rug before proceeding, for many of the colors are not fast. Apply the cleaner, after the rug has been thoroughly swept, with a soft brush or sponge, a small area at a time. Rub in well and rinse with water.

Photography as an avocation has practically recreated an industry. Glycerin is an ingredient of films, emulsions, and developers. Masking pastes require glycerin. These pastes must be so formulated as to have sufficient solids or bodying agents so that they will not flow down, or cause breaks in the film. Also they must be capable of being brushed to form a clean sharp edge. The proportion of glycerin must be sufficient to prevent the film from drying up under exposure for 24 hours. The following formula meets these requirements.

Glycerin	1 gal.
Whiting	1 lb.
Neutral Soft Soap	1 lb.

Mix the glycerin and soap and stir in the whiting.

To prevent curling the following photographic "stay flat" formula is advocated.

Gelatine	60 grams
Golden Syrup (Karo)	60 grams
Glycerin	60 grams
Chrome Alum	1.1 grams
Water to make	1 liter

Mix the syrup and the glycerin in ¾ of the water, soak the gelatine in this mixture for half an hour, and then warm to 120° F. Dissolve the alum in 60 cc. of water, add to the mixture and make up to one liter with water. Thirty grams of this will cover 100 square inches. The mixture sets in 24 hours. All of the preparation should be used at the time it is made, since it cannot be remelted.

Miscellaneous Uses of Glycerin

Careful use of glycerin will enable one to treat poor flat negatives so as to yield snappy, animated pictures with excellent contrast. By the same procedure, hard, sharp negatives can be made to print soft sketchy photos.

Numerous glycerin containing specialty preparations could be listed. For example, use of glycerin is suggested in enamel manufacture to replace oil or water to keep the enamel moist without affecting the color, and because on heating it evaporates at 290° C without leaving a residue. (10) As an ingredient of paper sizes, the hygroscopic action of glycerin maintains the shrinkage co-efficient of the size and paper equally, preventing wrinkling and curling in storage. It is used extensively in carbon and other duplicating papers and in stencil coating compositions. A recent patent indicates glycerin's value in non-corrosive fluid mixtures for cooling systems. (11) Pure glycerin has been highly recommended as a drying agent for gases. Glycerin solutions often replace water in the wet type of gas meters, to prevent freezing, since the addition of glycerin lowers the freezing point. A 30 per cent. solution of glycerin in water freezes at 21° F., 11 degrees below the water freezing point.

In cigarettes glycerin is regarded as practically indispensable because it absorbs and retains moisture and prevents dryness without leaving any odor on the breath of the smoker. Pipe tobacco stays fresh after the container has been opened because of glycerin.

Glycerin prevents boiler scale formation. When added to the water in the boiler, glycerin increases the solubility of lime salts, specially the sulfate. Soluble compounds are formed, and when the lime concentrations become so large as no longer to form these soluble compounds, a gelatinous substance is precipitated which does not adhere to the surface of the iron plates and which is not carried by the steam into the cylinders of the engine. One pound of glycerin should be added to the water for each 400 pounds of coal burned.

Large quantities of glycerin are absorbed by the printing and lithographing trades, in plastic resins, by steel mills, where it is used as a quenching medium, and in foods, pharmaceuticals, and cosmetics. Many uses of glycerin have been indicated, suggesting the advisability of research by the makers of chemical specialties on its possible adaptability for their special problems.

Bibliography:

10. Vielhaber, L., Emailwaren—Ind. 11, 324 (1934).
11. U. S. Patent, No. 1,970,564, K. H. Hoover, Aug. 21, 1934.

Developments in Sulfonated Oils

Two new developments in analysis of sulfonated oils were described by Dr. D. Burton and G. F. Robertshaw at a meeting of the British Section of the International Society of Leather Trades Chemists in October.

Although the behavior of these oils could be satisfactorily judged only from trial tests, some chemical control is necessary to detect variations in constituents such as water and oily matter. Common method is to determine the water, ash and unsaponifiable matter, and call the remainder saponifiable matter or "sulfonated oil." This is subject to serious errors. The xylene distillation method of determining water is inaccurate, as sulfated oils were liable to decompose at the temperature of boiling xylene. Tate and Warren's method of distillation with heptane (b.p. 100° C.) is being applied to sulfated oils.

The ash did not include any ammonium salts in oils neutralized with ammonia. Saponifiable matter might consist of sulfation products, unchanged oil, or added oil such as cod oil. A new method was described for determining the oily matter in a sulfated oil. This was devised to give a measure of its lubricating value, and was based on the idea that its pH is reduced to about 3.0 when it comes into contact with leather. The oil is acidified with hydrochloric acid in the cold, and the oily matter extracted with carbon tetrachloride, and weighed after driving off the solvent. This Burton-Robertshaw method, it was stated, gave results which were of a higher order of accuracy than other methods available, and were reproducible among independent workers.

Because the movement of the universe responds to known and inflexible laws, a planetarium can recapture the heavens at any age in Earth's history or accurately forecast the sky of the future. And because Diamond Alkalies, too, are products of exact control, their user can eliminate possible uncertainties of the past and map his future course with assurance, insofar as his alkali ingredients are concerned. Throughout industry Diamond Alkalies are known as products of the highest quality, constantly uniform in strength and purity, and unfailingly dependable in supply.

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58% Soda Ash — Bicarbonate of Soda — 76% Caustic Soda

Carbon Tetrachloride — Diamond Soda Crystals

Modified Soda — Special Alkalies — Liquid Chlorine

DIAMOND ALKALIES

Household Specialties

Disinfectant Makers Reelect Eddy

The National Association of Insecticide & Disinfectant Manufacturers meeting at Philadelphia last month reelected W. B. Eddy, Rochester Germicide, to the presidency. W. G. Griesemer of the Black Flag Co., Baltimore, is 1st vice-president; J. L. Brenn, Huntington Laboratories, Huntington, Ind., is 2nd vice-president; John Powell is again treasurer, and John H. Wright is the secretary. The Association voted to hold the Mid-Summer Meeting at the Edgewater Beach in Chicago, turning down the suggestion for a Bermuda cruise. No appropriation for cooperative publicity work for the year '37 was made. The association went on record as favoring amendment of the Robinson-Patman Act. A large number of guests attended the sessions, including the Hon. S. Davis Wilson, Mayor of Philadelphia; Frank Blair, president, The Proprietary Association; Dr. F. L. Campbell, associate professor of entomology, Ohio State; Dr. Alvin J. Cox, chief, Division of Chemistry, Dept. of Agriculture, State of California; James B. Fry, Director of Bureau of Standards, Commonwealth of Pennsylvania; Dr. George E. Grattan, secretary Advisory Board, Dept. of Agriculture, Ottawa, Canada; Dr. E. L. Griffin, senior chemist, Insecticide Division, Food & Drug Administration, Washington, D. C.; Dr. H. B. Haag, professor of pharmacology, Medical School of Virgina, Richmond, Va.; Dr. Hawkins, Bureau of Entomology & Plant Quarantine; James F. Hoge, general counsel, Proprietary Association; Dr. William Hunsicker, director of Public Health, Philadelphia; Ray Schlotterer, secretary, Allied Drug & Chemical Division of the N. Y. Board of Trade; and Dr. Louis Tuft, director of Bureau of Laboratories, Commonwealth of Pennsylvania.

W. B. EDDY
Again heads N.A.I.D.M.

Recent Violations of the Federal Insecticide Act

The failure of manufacturers to place on the labels of their products the ingredient statement required by the Federal Insecticide Act formed the basis of the majority of prosecutions recently terminated under that statute, the Food and Drug Administration reports. Act provides that if a preparation contains an ingredient inert against insects or fungi the label must bear an ingredient statement. Manufacturer has the option of stating upon the face of the principal label of an insecticide, fungicide, or disinfectant, either the name and percentage amount of each and every inert ingredient contained therein and the fact that it is inert, or the name and percentage amount of each and every active ingredient, together with the total percentage of inert ingredients.

After a plea of guilty, Huntington Laboratories of Colorado, Inc., Denver, was fined $150 for shipping in interstate commerce a misbranded disinfectant called "San-Pheno." Preparation contained more than 65% of water and the label failed to bear the ingredient statement required by the Insecticide Act. The product was represented as being positive in bactericidal action and high in germicidal strength, and was recommended for disinfecting purposes, including the disinfection of surgical instruments. It was ineffective when used as a disinfectant at the dilutions specified.

The Cooperative G. L. F. Mills, Inc., Buffalo, N. Y., pleaded guilty to two informations charging violation of the Insecticide Act in the misbranding and adulteration of "G L F Copper Lime Dust" and misbranding of "G L F Lime Sulfur Solution." The latter product contained more than 68% of water and the label bore no ingredient statement. The Copper Lime Dust fell below the professed standard and quality under which it was sold, containing less than the 15% of calcium arsenate claimed on the label. A fine of $150 was imposed.

Jacob A. Meinhardt, trading as the Laboratory Products Co., Chicago, Ill., was fined $25, after a plea of guilty, for shipping in interstate commerce a misbranded disinfectant called "Klen-Zit." The product contained more than 94% of water and other inert ingredients, and the labeling bore no ingredient statement.

Marshall Products, Inc., St. Louis, was fined $50 for shipping in interstate commerce a misbranded "Oil Emulsion." The product contained more than 61% of water, and no ingredient statement appeared on the label.

A criminal prosecution against Samuel Kovacs and Joseph Weishaus, trading as the Royal Manufacturing Co. of Duquesne, Chicago, Ill., resulted in a plea of guilty and a fine of $50. Three products were involved in this case—"Wayco Mosquito Lotion," "Bugine Roach Powder," and "Monogram Insect Powder." The term "Insect Powder" is used to designate a product consisting entirely of pyrethrum powder, and was misleading when applied to the "Monogram Insect Powder," since this preparation contained borax and other inert substances in addition to pyrethrum powder.

The product was also in violation of the act in that no ingredient statement appeared upon the label. The Roach Powder was adulterated and misbranded, being below the professed standard or quality under which it was sold. It contained less sodium fluoride and sodium bifluoride and more inert ingredients than claimed.

Two moth preparations, "Aroma Moth Vaporizer" and "Termox Mothproofing Crystals" were the subject of a criminal prosecution against Ben Berg and Sol Nathan, trading under the name of the Berg and Nathan Sales Co., Chicago, Ill. The "Aroma Moth Vaporizer" consisted of less than 2% of paradichlorobenzene and more than 98% of sodium chloride (common salt), an inert ingredient not stated on the label, and was recommended for the control of moths. The "Termox Mothproofing Crystals" contained about 60% of common salt, and no ingredient statement appeared upon the label. A plea of guilty was entered and a fine of $25 imposed.

Enoz Chemical, 2367 Logan Blvd., Chicago, will stop advertising "Enoz Moth Spray" as the undisputed leader in its field, as the most economical and effective method of moth control ever known, and that this article re-lusters upholstered furniture, carpets or rugs, or brings out the original color.

Afta Solvents Corp., 460 W. 128th st., N. Y. City, manufacturer of a cleaning fluid, has been ordered by the Commission to discontinue certain unfair representations in the interstate sale of its product.

Hollingshead Pleads Guilty

The R. M. Hollingshead Corp. of Camden, N. J., pleaded guilty to an information charging violation of the Federal Caustic Poison Act in the labeling of "Little Wonder Drain Pipe Solvent." The case was brought in the U. S. District Court at Camden, and a fine of $150 was imposed. The action involved two shipments of the product bearing the same labeling. The second shipment was made several months after the corporation had been warned by citation and hearing in regard to the violation of the law in the labeling of the first shipment. This feature of the case was declared by the presiding judge to be a "serious matter" and influenced him in assessing the fine. A considerable quantity of the last shipment had been seized before prosecution was instituted.

News of the Chemical Specialty Companies

Melvin Fuld and Joseph Fuld have purchased all of the assets and liabilities of the corporation known as Fuld Bros.,

WE'VE MOVED

SO MAKE A NOTE OF THIS THE NEXT TIME YOU NEED CHEMICALS

We have moved our New York Sales Office to the new International Building at 630 Fifth Avenue. Here, in Radio City, we are in the center of the chemical district and thus more conveniently located to serve you.

We have also moved our Distribution Center to Ridgefield, New Jersey—3½ miles from the Hudson River in the heart of the industrial East. In a new building especially designed and built for our needs, we have every modern facility to maintain the high standard of Turner chemicals and give you still better service on your next order.

DROP IN AND SEE US

JOSEPH TURNER & COMPANY

RIDGEFIELD, N. J.

83 EXCHANGE PL.
PROVIDENCE

630 FIFTH AVE., NEW YORK

40TH ST. & CALUMET
CHICAGO

Inc., Baltimore. Change was made because of greatly increased taxes. There will be no change in the assets of the business, business policies, or the type of product manufactured. Company is one of the largest producers in the country of household and industrial chemical specialties and is a large factor in the private label field.

R. M. Hollingshead Corp., manufacturer of automotive chemicals, is taking over the plant of the Keystone Leather Co., Camden, N. J. New property will increase the company's floor space to about 15 acres. Expansion will provide work for about 500 additional persons.

A new Phoenix enterprise, the Arizona Exterminating Co., has established offices in the Title and Trust Bldg., under direction of G. E. Wilson, formerly of N. Y. City.

Capital Chemical, manufacturer of household insecticides in Montgomery, Ala., had a small fire last month but production was not interrupted.

In a move to rehabilitate the turpentine industry, Turpentine and Rosin Factors, Inc., Jacksonville, Fla, are planning an extensive campaign to market pure gum turpentine as an old household product. The product will be known as Pure Gum Spirits of Turpentine. It will be double-dehydrated and distributed in small containers. Milton Bacon will be in charge.

Lever Bros. started a new weekly network show for Rinso and Lifebuoy, Dec. 22nd.

Millikan, Midland Chemical, Dies

Lovell D. Millikan, 73, president, Midland Chemical, died Dec. 10th following a heart attack.

Industrial Specialties

Symposium Planned on Lubricants

The 1937 American Society for Testing Materials Regional Meeting which is to be held at The Palmer House in Chicago during the week of March 1st will be featured by a Symposium on Lubricants, and a Symposium on Corrosion Testing. Each of these symposiums will comprise technical papers by outstanding authorities in the respective fields.

A paper is to be given by Dr. G. M. Maverick, Standard Oil Co. of N. J., on "Addition Agents for Lubricating Oils," including such materials as pour point depressors, viscosity index modifiers, oiliness addition agents, oxidation inhibitors, etc.

Speare Supply in Larger Quarters

Speare Supply Co. has taken over a large warehouse and office at 115 Lafayette ave., St. Louis. Cordry A. Gordon has been made local branch manager. Company has been in the laundry supply business for 30 years and maintains offices in N. Y. City, Boston, Chicago, Detroit, and Kansas City.

Snell to Pass on Finishes for Maple Floors

The Maple Flooring Manufacturers Association has issued specifications on heavy duty finishes for use on maple, beech and birch flooring. To receive the seal of approval of the MFMA such products must first be submitted to Foster D. Snell, Inc. for laboratory examination after which service tests may be required. An approved list of products is to be issued early in '37.

Burkart-Schier Increases Manufacturing Facilities

Burkart-Schier Chemical announces the construction of a new warehouse and manufacturing plant which is located on 13th and Chestnut sts., in Chattanooga. It is of brick and steel construction with concrete floor and containing 25,000 sq. ft. of floor space. Part of the new building will be used for chemical storage and part for a sulfonating plant. New building is connected with the old by covered runways and loading platforms. General offices will be located on the 2nd floor.

A modern plant control laboratory is located in the manufacturing division. It is claimed that the sulfonated oil plant is one of the most modern in the country. The old plant will be used for acid and heavy chemical storage. The Burkart-Schier company manufactures sulfonated oils, softeners and specialties for the textile trade and act as jobbers of textile and industrial chemicals.

Onyx Oil Engages Gansel

To further extend its policy of cooperation and service to the processing trade, Onyx Oil & Chemical, Jersey City, N. J., announces that Dr. Eugene Gansel has joined its staff as field consultant and demonstrator. He is well known for his work as "trouble-shooter" over a period of 9 years with United Piece Dye Works, and for his successes in process development with that company.

New Industrial Chemical Specialties Reported

Alrose Chemical is now placing on the market a "white brass" plating solution under the trade name Wite-Brass. This is claimed to be as white as silver, to be non-tarnishing and to be extremely simple to control.

Described as a fine-particle wax emulsion, a new glossy finishing material has been introduced by Franklin Research. Sold under the name of Formula F-77, this new finishing material is said to leave a thin, lustrous film that overcomes tackiness, prevents oxidation and resists dirt, dust and water. It is easy to apply, dries quickly and is economical to use, according to Franklin Research.

Under the trade-name, "Metso 99," Philadelphia Quartz is offering sesquisilicate of soda, a new compound of sodium and silicon, for which it claims particular desirability and usefulness as an alkaline cleanser. Metso 99 is said to have more cleansing power than is the property of soda ash, trisodium phosphate, or metasilicate of soda, and at the same time to afford control of cleansing activity, which is not possible with caustic soda. Metso 99 is said to act quickly in removing grease, oil, and dirt generally, and the manufacturer says that it has been proved by practical test to be a superior alkali for industrial cleaning under many conditions. Particulars may be obtained by addressing the Philadelphia Quartz Co., 120 S. 3rd st., Philadelphia.

A mold lubricant that can be used on all types of molds has been introduced by Standard Chemical, Akron, under the trade name of Lubrex. For the average rubber product the manufacturer recommends a 2% water solution. The new product may also be used to treat uncured stock as it comes from the tubing machine or mixing mill to avoid flying dust, a 3% solution being recommended for this use.

Soap Prices Rise as Raw Materials Soar

With a 4% increase in the price of several soap brands already in effect further advances are anticipated by the trade. Quotations on several soap oils are now almost double the levels prevailing earlier in the year, while prices on other oils reflect increases of 50% or more. Since wages paid by soap manufacturers are also advancing, further increases in soap prices are necessary to protect manufacturers' margins of profits, reports the *N. Y. Journal of Commerce*.

Improved returns from the sales of glycerine have offset the rise in oil costs to a certain extent. However, glycerine prices have not risen as sharply as have oil costs, and consumers of the former are no longer paying the premiums over scheduled lists which prevailed several weeks ago.

Europe has been a heavy buyer of oils which yield glycerine in recent months. Owing to the 30% tariff on soaps, however, and the fact that soaps here sell on a basis below fats costs, substantially increased imports of soap are not anticipated.

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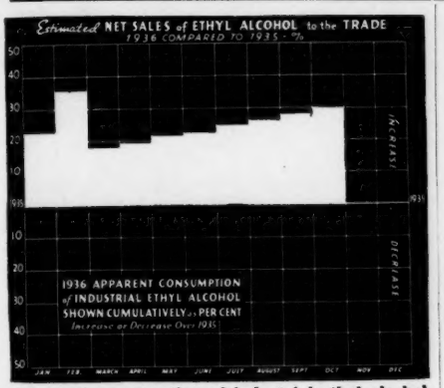
SOLVENT NEWS

Reg. U. S. Pat. Off.

JANUARY ★ A Monthly Series of Technical Articles for Chemists and Executives ★ 1937


Estimated NET SALES of ETHYL ALCOHOL to the TRADE
1936 COMPARED TO 1935 - %
INCREASE
DECREASE
1936 APPARENT CONSUMPTION
of INDUSTRIAL ETHYL ALCOHOL
SHOWN CUMULATIVELY - PER CENT
Increase or Decrease Over 1935
JAN. FEB. MARCH APRIL MAY JUNE JULY AUGUST SEPT. OCT. NOV. DEC.

Apparent consumption of industrial ethyl alcohol from Jan. 1 to Oct. 31, 1936, was 56,741,000 wine gallons. This is 29.8 per cent greater than during the same period in 1935 when 43,695,000 wine gallons were consumed.

Price schedules on pure alcohol, specially denatured formulae and ester solvents, for the first quarter of 1937 were announced on December 4. Normal butyl alcohol and normal butyl acetate were advanced a half cent per pound.

RAYON PRODUCTION INCREASES ALMOST 800 FOLD IN 25 YEARS

Rayon yarn production will have increased nearly 800 fold in 25 years if the expected 275,000,000 pounds was actually produced in 1936. The 1911 total was only 363,000 pounds.

Still further increased volume is expected to result from a number of recent developments in the industry. Definite interest is apparent in the new short staple fibre already popular in Europe, and experiments in the use of rayon as a tire fabric are proceeding.

There are three basic methods for producing artificial silk in America: (1) Cellulose acetate, (2) Cellulose Xanthate (Viscose) and (3) Cuprammonium.

The largest volume of rayon is produced by the Cellulose Xanthate process, but observers report that cellulose acetate yarns made by far the largest gains last year.

USE WOOD OIL AND FLAKE MICA TO SOLVE COATING PROBLEMS

Two recent patents for coating compositions represent unique attempts to solve several problems of long standing.

Under the first patent, chinawood oil is made compatible with nitro-cellulose and the usual solvents and plasticizers, by blowing with air at a temperature between 100° and 280° C. in the presence of small percentages of sulfur. Lacquers formulated with the blown oil are said to rank high in alcohol proofness.

In the second patent, advantage is taken of the leafing and overlapping action of mica flakes in combination with resin varnishes to provide a lining or a coating for foodstuff cans. Films thus fortified are claimed to be much harder and abrasion resistant as well as having greater resistance to fruit acids, steam and alkalies met in food processing.

Charts illustrating a simple method for determining the amount of liquid in a 54-gal. drum may be secured by writing to U. S. I.

NEW LACQUER COATING FOR PAPER REFLECTS 94 PER CENT OF LIGHT

Low Grade Papers May Be Utilized; Possible to Print on Lacquered Surface

Paper which will reflect 94 per cent of all light can now be produced with a special lacquer recently perfected by a large ink and varnish manufacturer. Regarded as one of the most significant advances yet made by the paper coatings industry, the newly patented process is expected to have immediate commercial importance.

Not only do the latest and most exact tests with spectrophotometric equipment indicate that this is a "whiter" white than that of any other paper surface, varnished or otherwise, but other properties give it several advantages.

The lacquered stock has a brilliant and glossy surface, while sheets are highly flexible and moisture resistant. Moreover, paper so treated is exceptionally well adapted to printing. Tests have shown that ink requirements can be kept at a minimum because of the smooth, non-absorbent surface produced, and low grades of paper can be utilized. The coated surface need not be sprayed with varnish or clear lacquer after printing.

Special Effects Possible

Varied effects for different types of work are possible by the addition of modifying agents to the liquid. Special inks which will dry almost instantly to either a dull or gloss finish are available to increase the number of combinations which may be obtained.

A wide field of applications is foreseen. Labels, magazine inserts, decorative wrapping paper, bags, box coverings and packages will undoubtedly be some

(Continued on next page)

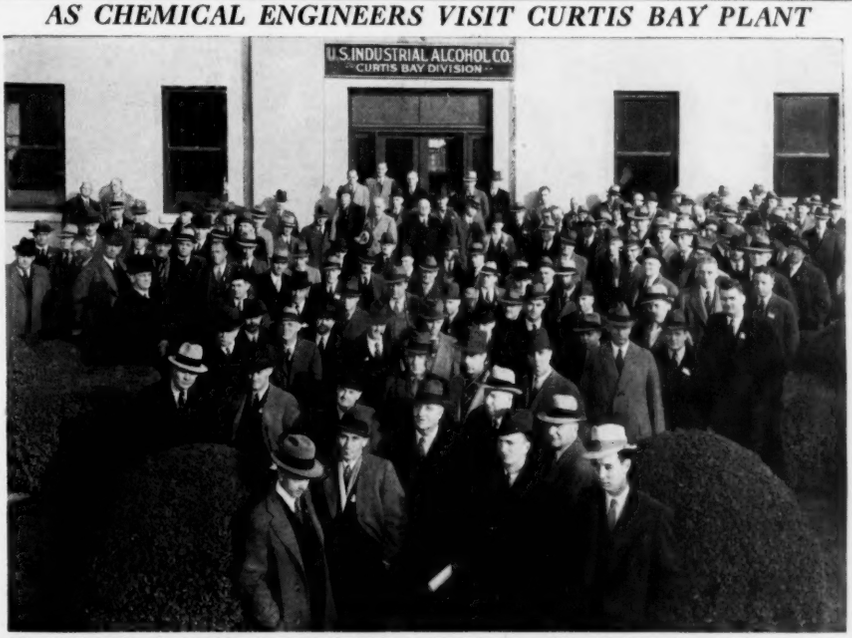
PAUL HARRISON RETIRES

Marking close to a half century of service, Paul Harrison brings to a close on January 1, 1937, one of the longest and most active careers in the alcohol industry. He retires as Sales Manager of the New York division of the U. S. Industrial Alcohol Co. and as President of James A. Webb & Son, a subsidiary company of U. S. I.

Mr. Harrison entered the alcohol field in 1890 when he joined James A. Webb & Son, which was founded in 1835. As Sales Manager of Webb, Mr. Harrison was laying the foundation for his wide knowledge of buyers' problems that served him so well in future years. His brother, F. M. Harrison, later to become U. S. I. President, was also connected with Webb.

When the House of Webb became a part of U. S. I. in 1915, the move was hailed as a happy combination of the best traditions and distributing experience of "Webb" and the great technical and manufacturing resources of U. S. I. Mr. Paul Harrison assumed his new duties as N. Y. Sales Division Manager with a growing number of problems confronting the industry. The heavy burden of sales and shipments of war-time alcohol fell upon his shoulders. In recent years his counsel won him high esteem among friends and associates.

AS CHEMICAL ENGINEERS VISIT CURTIS BAY PLANT



The Staff of the Curtis Bay Plant of U. S. I. was host to several hundred members of the American Institute of Chemical Engineers during their convention in Baltimore. Under the guidance of U. S. I.'s Vice-President Backus in Charge of Production, the engineers viewed the operation of a large industrial alcohol plant, including the largest anhydrous alcohol installation in this country.

ADVERTISEMENT—*This entire page is a paid advertisement.*

JANUARY ★ **SOLVENT NEWS** ★ 1937

NEW LACQUER COATING

(Continued from preceding page)

of its more important uses. The characteristics of high flexibility make it a suitable coating for paper to be sealed on high speed machines.

Uses No White Pigment

One of the more remarkable features of the coating, is that complete opacity is achieved without the use of any pigment. Applied as a clear liquid, the lacquer develops upon drying what is known to the paper industry as "blush". This property, actually considered a disadvantage in past practice, is utilized in a new manner.

By bringing about a new cellular arrangement, the clear liquid becomes a white opaque coating when dried, which induces marked light scattering characteristics. Pressure causes a further cellular readjustment in the coating and a consequent change in the appearance.

A number of modifications permit the lacquer to be adapted to the widest variety of applications. Permanent tints and shades may be obtained when only a very small amount of dispersed pigment is introduced into the liquid. Since the original lacquer dries to an opaque white, as little as two per cent of full strength toners will produce the desired effect. Metallic powders and pearl essence may be introduced, while special resistant qualities may be imparted by the addition of resins and plasticizers. Other effects are now being studied.

The application of the new lacquer does not involve new and expensive equipment. Conventional paper coating lacquer equipment of the reverse roll or knife type may be used. Drying proceeds in the usual manner, the liquid "setting" in a short time.

Color Graphed and Cabled By Two New Instruments

Evidence that the science of color is gaining sounder footing is provided by two new devices recently announced.

One large printing ink company is now using what is called a recording spectrometer. The instrument, a new invention, is employed for matching and standardizing ink. Exact graphical records of each shade make possible a degree of control not known heretofore.

"Colorcable" is the name given to another machine for transmitting color samples via cable or telegraph. In recent tests, the corporation operating the process was able to cable Paris fashion colors to New York and consummate their sale to a large wholesale chain and its distributors all in a matter of minutes. A number of textile manufacturers have already subscribed to the service.

Make Variety of Hansa Yellows from U.S.I. Intermediates; Acetoacetanilid Most Important

With lower prices for the intermediates, Hansa Yellows are finding an increasingly broader scope of applications. Long known as brilliant colors of high permanence, they have excellent working qualities, particularly on the lithographic press. Alkali fastness is another factor extending their uses. Because of their high tinctorial strength, they are very often used to tone weaker yellows such as chrome yellow. Working qualities of chrome yellows are also improved by blending with Hansa Yellow.

Two important intermediates for the manufacture of Hansa Yellows are manufactured by U. S. I., the well known acetoacetanilid and its substituted form, acetoacet-o-chlor-anilid.

The most widely used shades which can be produced with the two intermediates are Hansa G, 3G, 5G, and 10G.

Acetoacetanilid coupled with diazotized meta-nitro-para-toluidine gives Hansa Yellow G, a lemon shade at present the most popular. If para-chlor-o-nitraniline is used in place of meta-nitro-para-toluidine, the 3G shade is formed.

Acetoacetanilid is also employed to manufacture 5G which is slightly lighter than G. Ortho-nitraniline is the other intermediate entering into this reaction.

Acetoacet-o-chlor-anilid combined with diazotized para-chlor-o-nitraniline gives Hansa Yellow 10G, a light canary shade.

In addition to acetoacetanilid and acetoacet-o-chlor-anilid, U. S. I. is now in a position to offer para-chlor-o-nitraniline. U. S. I. chemists are also pursuing studies on other modifications of acetoacetanilid.

TECHNICAL DEVELOPMENTS

The items in this column are gathered from many varied sources. Further information may be obtained by writing to U.S.I.

U S I

Fire-resistant canvas duck is available either as a finished fabric or as a separate finish which can be applied either by painting or spraying, announces a manufacturer. The product is said to be the result of 10 years' research.

U S I

Synthetic pitch with a wide range of melting points and a color span from black to very light shades has been perfected, according to a manufacturer's recent announcement. Adaptability to the individual needs of the roofing, paint and plastics industries is supplied with 26 different types.

U S I

Regulation of air pressures less than 30 lbs. per sq. in. to a new degree of sensitivity is reported for a new model regulator. A sensitivity approximately six times that of standard types is credited to a 4 in. diaphragm which is clamped between two brass castings.

U S I

Adhesives produced with a new water-soluble synthetic resin are expected to find wide application in the manufacture of plywoods, plastic moldings, paper and textiles. Very little water is necessary to plasticize the resin for use, it is claimed. After heat treatment, the resin becomes permanently hard and has a high resistance to water and weather at ordinary temperatures.

U S I

Galvanized sheet metal which can be painted without special treatment of the surface has been developed. The manufacturer states that the sheets have the protection of a special insulating coating that keeps the paint from direct contact with the zinc coating. The sheets are supplied in regular and extra smooth finishes.

U S I

Lithographic varnish prepared by a new method is claimed to be free from oxidation and gel structure. Improved color and better wetting properties are also attributed to the new process.

U S I

An instrument for measuring the thickness of a paint film on metal by stylus penetration is said to be sensitive and fool-proof. An electrically operated amplifying unit magnifies the feeble current as soon as metal-to-metal contact has been established.

U.S. INDUSTRIAL ALCOHOL CO.
INDUSTRIAL CHEMICAL CO., INC.

WORLD'S LARGEST PRODUCERS OF ALCOHOL DERIVED SOLVENTS

ALCOHOLS
Amyl Alcohols
Refined Amyl Alcohol
Refined Fusel Oil
Secondary Amyl Alcohol
Ethyl Alcohols
Specially Denatured—All Formulas
Completely Denatured—All Formulas
Anhydrous-Denatured
Absolute—Pure
C.P. 96%—Pure and Denatured
Solox—The General Solvent
Super Pyro—The Rustproof Anti-freeze
Pure (190 Proof)—Tax Paid, Tax Free

ALCOHOLS
Butyl Alcohols
Normal and Secondary
Methyl Alcohol

ANSOLS
Ansol M
Ansol PR

ETHERS
Ethyl Ether
U.S.P. and Absolute (A.C.S.)

NITROCELLULOSE SOLUTIONS
Collodions
U.S.P., U.S.P. Flexible and Photo
Cotton Solutions

ESTER SOLVENTS
Acetic Ether
Amyl Acetates
High Test
Commercial
Technical
Secondary
Butyl Acetates
Normal
Secondary
Diatol
Diethyl Carbonate
Estersols
Ethyl Acetates
85-88%, 99%, and U.S.P.
Ethyl Lactate

PLASTICIZERS
Diamyl Phthalate
Dibutyl Phthalate
Diethyl Phthalate
Dimethyl Phthalate

OTHER PRODUCTS
Acetoacetanilid
Ethyl Acetoacetate
Ethyl Chlorcarbonate
Ethyl Oxalate
Ethylene
Sodium Oxalacetate
Acetone
Methyl Acetone
Curbay Binder
Potash By-products

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CHEMISTRY

THE KEYSTONE OF INDUSTRY

There is scarcely an industrial development or a manufacturing process that is not rooted in the achievements of chemistry. And it is fitting that a firm which has played such an important part in this field as has Pennsylvania Salt Manufacturing Company should have as its trademark the Keystone symbolizing the place of chemistry in modern business.

Among the outstanding developments of this Company is a process that renders electrolytic Caustic Soda doubly pure, resulting in a desirably low iron and salt content. We supply Caustic Soda in aqueous solution in 8,000 gallon tank cars as well as in solid, flake, or ground form in drums. The services of our technical staff are always available.

Following are a few of the Pennsylvania Salt Manufacturing Company products:—

Chloride of Lime (Bleaching Powder)
Kryolith (Natural Greenland Cryolite)
Chlorine
Sodium Orthosilicate
Carbon Tetrachloride and Carbon Bisulphide

EST. 1850 TRADE MARK

PENNSYLVANIA
SALT MANUFACTURING COMPANY

EXECUTIVE OFFICES, WIDENER BLDG., PHILADELPHIA, PA.

BRANCH SALES OFFICES: NEW YORK · CHICAGO · ST. LOUIS · PITTSBURGH · TACOMA · WYANDOTTE

Packaging, Handling and Shipping

Hearings Open Before I.C.C. on Freight Increases

The hearings on increases in freight rates petitioned for by the Class One railroads opened in Washington Jan. 6th, and will continue until about Jan. 15th or 16th, when adjournment will necessarily be taken for about 10 days on account of the Presidential inauguration.

After the applicant carriers have completed their evidence of the general nature at the beginning of the hearing, they will offer evidence relating to individual commodities and groups of commodities.

The first commodities considered were: coal and coke, iron ore, chrome ore and concentrates, manganese ore and concentrates, and all types of iron and steel.

The I.C.C. which made known the details of the opening hearings in a letter to the AAR, said that it would see how the case develops before undertaking to prepare a program beyond the date of adjournment, Jan. 15 or 16th.

Novel Welded Piping System Described

An interesting pump and piping system of welded construction was recently installed by the pipe crew of a large corn syrup products manufacturing plant. The system itself as well as the savings accomplished by welding are worthy of notice. In essence, the work involved the fabrication of a system for unloading syrup from tank cars and boats, transferring it to storage tanks and the refinery, and also for loading in cars and boats. The details of the system are explained in the January issue of *Oxy-Acetylene Tips*, published by the technical publicity department of Linde Air Products, 205 E. 42 st., N. Y. City.

Continental Can to Build in Tampa

Continental Can purchases 45 acres in Tampa, Fla., which will be used for a new can plant.

Jury for Wolf Packaging Awards Announced

Personnel of the jury of award for the 6th annual Irwin D. Wolf awards competition for distinctive merit in packaging was announced last month. The jury includes Richard F. Bach, Metropolitan Museum of Art; James C. Boudreau, Pratt Institute; Mrs. Lillian M. Gilbreth, president, Gilbreth, Inc.; T. V. Houser, Sears, Roebuck, & Co.; C. B. Larrabee, *Printers' Ink*; Edwin I. Marks, R. H. Macy & Co.; Mrs. William Brown Meloney, editor, *This Week;* Ray M. Schmitz, General Foods Sales Co.; and W. H. Weintraub, Esquire, Inc. Closing date for entries is Feb. 10th and awards will be presented during the 7th Packaging Exposition, Hotel Pennsylvania, March 23 to 26th.

The coming Packaging Exposition will feature for the first time the separate division for consideration of bulk packaging problems. Round-table discussions on various aspects of bags and drums will be held and the committees in charge have held several meetings to prepare suitable programs for discussion.

I.C.C. Exempts Company Owned Trucks

The I.C.C., in a ruling dated Dec. 5th, exempted company owned trucks from compliance with the general provisions of the Motor Carrier Act in connection with such transportation except as to any regulations that the Commission may issue for private carriers as to maximum hours of service of employees, safety of operation, or standards of equipment.

Accurate Sacking Scale Marketed

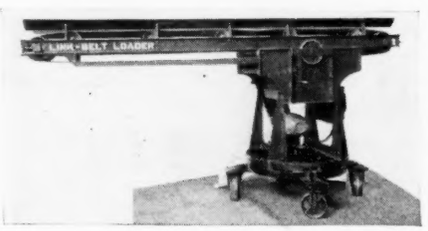
Where both speed and accuracy are highly essential in sacking operations the new Speed Sacking Scale developed by The Exact Weight Scale Co., Columbus, Ohio, is recommended by this well-known manufacturer of weighing and sacking equipment. According to the company's engineers in ordinary production tests these visible weighing units have delivered in volume and accuracy far in excess to similar types of scales. They recommend its use particularly for pellet type carbon black, fertilizers, asbestos, starch, salt, fish and bone meals, cottonseed cake, and a wide variety of industrial chemicals. The operator actually watches the last 25 lbs. as it goes into the sack. As the pointer approaches the Exact Weight mark on the dial he closes the shut-off valve and the package is turned out with accuracy and speed. The manufacturer claims that specific tests show conclusively that the use of this machine increases the sack yield from bulk.

National Can Acquires Pittsburgh Can

National Can, subsidiary of McKeesport Tin Plate Co., has acquired the business of the Pittsburgh Can Co. of Pittsburgh, Pa., manufacturers of steel kegs and pails. The Pittsburgh company has manufactured this line of containers for over 25 years and its addition to the National Can products will round out the latter company's line for paint, oil, varnish and chemical manufacturers and allied lines.

Link-Belt Announces Inexpensive Box Car Loader

Announcement is made by Link-Belt Co., 2045 W. Hunting Park Ave., Philadelphia, of the development of a new type of inexpensive box car loader for handling bulk materials without creating a lot of dust or degradation in the loading operation. The anti-friction belt conveyor constituting the loading element of the machine, is supported on a horizontal boom which is arranged so it can be racked back and forth, or rotated 360 degrees, by hand, on the castor-mounted truck on which boom is mounted. The conveyor is operated at a comparatively slow speed, and has a discharge height of 5 ft.

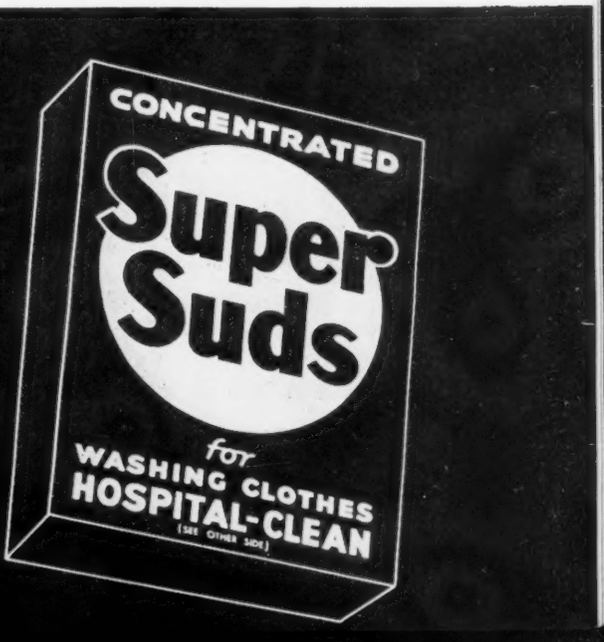


New Products—
New Packages

Another "Before and After" job that has attracted wide attention. Lowe Brothers Co., Dayton, Ohio, has redesigned its complete line of paints, enamels, and varnishes in new labels of modern design which reflect the pleasing effects secured by using the products. Arthur S. Allen, N. Y. City, a well-known expert in design and color, is responsible.

Geuder, Paeschke & Frey Co.'s steel package division has just announced its new Pour-Klean 5-gallon drum. Note the improved pouring spout.

Lectro-Sil, a resilvering solution produced by the Clapper Chemical Co., Everett, Pa., has been tested and approved by the Automotive Test Laboratories of America. Product finds wide use for resilvering old auto reflectors. The process is a very novel and effective one.



Colgate-Palmolive-Peet has announced Concentrated Super Suds (in a blue and white box with black printing) an important addition to its line. Product is specifically recommended for laundering of clothes. Super Suds in the red box is suggested for washing dishes.

The Purchaser

. . buys more than Chemicals

CARBIDE and Carbon Chemicals Corporation has, since its inception, conducted an organized program of research and development. This program has led, so far, to the commercial production of over eighty aliphatic organic chemicals. Many of these compounds were made available for the first time in commercial quantities; still others were created to fill the needs of industry.

In the course of this development, much valuable information and experience have been gained. Success in such a program has depended as much upon a mastery of the raw material requirements of the chemical and process industries as upon a detailed knowledge of the properties and technology of the products themselves.

This knowledge of chemicals, both as finished products of its work and as raw materials for its customers, has been an important contribution by Carbide and Carbon Chemicals Corporation to the development of many industrial applications. Such experience serves as a guarantee of the excellence of the products it sells and of the accuracy of its recommendations for their use.

CARBIDE AND CARBON CHEMICALS CORPORATION

Unit of Union Carbide and Carbon Corporation

UCC

30 East 42nd Street, New York, N. Y.

PRODUCERS OF SYNTHETIC ORGANIC CHEMICALS

A Summary of the Products of
CARBIDE AND CARBON CHEMICALS CORPORATION

ALCOHOLS
- Methanol
- Ethanol
- Isopropanol
- Butyl Alcohol (Normal)
- Hexanol (Normal)
- Methyl Amyl Alcohol
- Ethyl Butyl Alcohol
- Octyl Alcohol

GLYCOLS
- Ethylene Glycol
- Propylene Glycol
- Diethylene Glycol
- Triethylene Glycol

ALCOHOL-ETHERS
- Methyl Cellosolve
- Cellosolve*
- Butyl Cellosolve
- Methyl Carbitol
- Carbitol*
- Butyl Carbitol

ETHERS AND OXIDES
- Ethyl Ether
- Isopropyl Ether
- Dioxan
- Dichlorethyl Ether
- Chlorex*
- Ethylene Oxide
- Carboxide*
- Propylene Oxide

ALDEHYDES
- Butyraldehyde
- Crotonaldehyde
- Octyl Aldehyde

KETONES
- Acetone
- Methyl Acetone
- Methyl Isobutyl Ketone
- Methyl Amyl Ketone

ACIDS AND ANHYDRIDES
- Acetic Anhydride
- Butyric Acid
- Butyric Anhydride

ESTERS
- Methyl Acetate
- Ethyl Acetate
- Isopropyl Acetate
- Butyl Acetate (Normal)
- Methyl Amyl Acetate
- Octyl Acetate
- 2-Ethyl Butyl Acetate
- Methyl Cellosolve Acetate
- Cellosolve Acetate
- Carbitol Acetate
- Diethyl Sulphate
- Ethyl Acetoacetate
- Methyl Acetoacetate
- Dimethyl Phthalate
- Dibutyl Phthalate
- Ethyl Silicate

CHLORINATED COMPOUNDS
- Ethylene Dichloride
- Propylene Dichloride
- Trichlorethylene
- Chlorasol
- Ethylene Chlorhydrin
- Propylene Chlorhydrin
- Vinyl Chloride

AMINES
- Monoethanolamine
- Diethanolamine
- Triethanolamine
- Acetoacetanilide
- Ethylene Diamine
- Morpholine
- Diethylaminoethanol

VINYLITE* RESINS

ACTIVATED CARBON

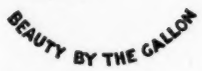
HYDROCARBON GASES
- Methane
- Ethane
- Ethylene
- Propane
- Pyrofax*
- Butane
- Commercial Butane
- Isobutane
- Propylene

*Trade-mark

New Trade Marks of the Month

355,827

360,238



367,187

368,777

379,094

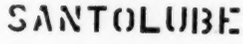
372,993

361,970

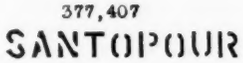
372,996

374,993

377,406



377,407

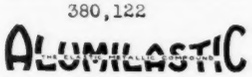


377,415

378,186

371,881

380,122



380,986

380,514

380,287

380,860

381,079

381,138

381,151

Trade Mark Descriptions†

355,827. Bulk Service Stations, Chicago, Ill.; Sept. 8, '34; petroleum products; use since Aug. 21, '34.

360,238. Norfolk Paint & Varnish Co., Quincy and Atlantic, Mass.; Jan. 14, '35; paints, varnishes, and lacquers; use since Jan. 1, '33.

367,187. Ditto, Inc., Chicago; July 12, '35; lubricating oil and grease; use since Aug. 31, '25.

368,777. Gladee Oil Co., Detroit, Mich.; Aug. 28, '35; lubricating oils and greases and gasoline; use since Aug. 1, '34.

379,094. Humble Oil & Ref. Co., Houston, Tex.; filed June 1, '36; rust removers and preventatives, and hydrocarbon solvents; use since Jan. 20, '36.

372,993. Pure Oil Co., Chicago; filed Dec. 23, '35; friction tape, gasket and rim cement; use since Feb. 5, '35.

361,970. E. J. Kelly Co., Kalamazoo, Mich.; Feb. 28, '35; printing inks, etc.; use since Jan. 30, '35.

372,996. The Pure Oil Co., Chicago; Dec. 23, '35; automobile polish and touch-up enamel; use since Apr. 2, '35.

374,993. Zinsser & Co., Hastings-on-Hudson, N. Y.; Feb. 18, '36; wood and organic material preservative; use since Nov. 8, '21.

377,406. Monsanto Chemical Co., St. Louis; filed Apr. 20, '36; chemical adjuvants for petroleum oils; use since Mar. 12, '36.

377,407. Monsanto Chemical Co., St. Louis; filed Apr. 20, '36; chemical adjuvants for petroleum oils to lower the pour point; use since Nov., '35.

377,415. Paragon Oil Co., Inc., Brooklyn, N. Y.; Apr. 20, '36; lubricating oil; use since Dec. 11, '35.

378,186. William S. Dietrich (Pokadot Chemical Co.), Greenville, Pa.; May 8, '36; laundry bleach and water softeners; use since Mar. 21, '33.

371,881. McNeil Laboratories, Inc., Philadelphia; filed Nov. 22, '35; various chemicals, drugs, etc.; use since June 1, 1900.

380,122. The Parr Paint & Color Co., Cleveland, Ohio; June 23, '36; viscid compounds for use in glazing, calking, and pointing; use since Feb. 3, '31.

380,986. The Con-Ferro Paint and Varnish Co., St. Louis; filed July 14, '36; ready-mixed paints, paint enamels and varnishes; use since Feb. 26, '36.

380,514. Hyper-Humus Co., Newton, N. J.; July 2, '36; fertilizers; use since June 30, '15.

380,287. Keene Washing Products Co., Keene, N. H.; June 26, '36; household detergent; use since Dec. 10, '35.

380,860. Certain-teed Products Corp., N. Y. City; filed July 10, '36; composition wall boards, gypsum wall boards, etc.; use since Jan. 10, '11.

381,079. The McAlester Fuel Co., McAlester, Okla.; July 16, '36; lubricating oils and greases; use since June 29, '35.

381,138. Scobell Chemical Co., Rochester, N. Y.; July 17, '36; aluminum oxide for use in determining carbon content of steel; use since Jan., '36.

381,151. Cities Service Oil Co., Dover, Del., and Chicago; July 18, '36; petroleum products; use since May, '34.

Chemical Specialty Patents*

Preparation of alcohol amine soaps of oil-soluble sulfonic acids derived from petroleum. No. 2,061,601. Karl T. Steik, Elizabeth, N. J., to Standard Oil Development Co., Del.

Sulfonic acid derivatives of aliphatic hydrocarbons useful as wetting and cleansing agents. No. 2,061,617. Frederick Baxter Downing, Carneys Point, N. J., and Richard Gesse Clarkson, Wilmington, Del., to du Pont, Wilmington, Del.

Sulfonated hydrocarbon derivatives. No. 2,061,618. Frederick Baxter Downing, Carneys Point, N. J., and Richard Gesse Clarkson, Wilmington, Del., to du Pont, Wilmington, Del.

Sulfonated aliphatic hydrocarbon derivatives, useful as wetting and cleansing agents. No. 2,061,619. Frederick Baxter Downing, Carneys Point, N. J., and Richard Gesse Clarkson, Wilmington, Del., to du Pont, Wilmington, Del.

Sulfonated derivatives of aliphatic hydrocarbons useful as wetting and cleansing agents. No. 2,061,620. Frederick Baxter Downing, Carneys Point, N. J., and Richard Gesse Clarkson, Wilmington, Del., to du Pont, Wilmington, Del.

Manufacture of decorative coverings from porous fibrous absorbent sheet materials. No. 2,061,705. James J. Jackson, Woodbury, N. J., to Paulsboro Mfg. Co., N. J.

Process for making brake bands from rubber, rubber solvent, sulfur and filler ingredients. No. 2,061,918. William Nanfeldt, Clifton, N. J., to World Bestos Corp., Paterson, N. J.

Brake band containing asbestos and banding material. No. 2,061,919. William Nanfeldt, Clifton, N. J., World Bestos Corp., Paterson, N. J.

Hydraulic cement containing chromium trioxide. No. 2,061,972. Ellis W. Reed-Lewis, Windsor, Ontario, Can.

Metal cleaner and brightener containing 2 parts phthalic anhydride, 5 parts sodium sulfate, 5 parts soap, and 5 parts soap bark. No. 2,062,038. Harry B. Rathbun, Waterbury, Conn.

Dry cell construction. No. 2,062,107. Otto Karl Reinhardt, Jamaica, and John William Baer, Elmhurst, N. Y., to Bond Electric Corp., Jersey City, N. J.

Grease containing lubricating oil, less than 30% of a calcium or aluminum soap, and less than 5% of a linear polymer from the group consisting of polymerized isobutylene and polymerized hydroxy-stearic acid. No. 2,062,346. John C. Zimmer, Hillside, and Arnold J. Morway, Roselle, N. J., to Standard Oil Development Co., Del.

Bituminous paving mixture containing a priming oil, a wetting agent, mineral aggregate, and powdered asphalt. No. 2,062,348. Charles M. Baskin, Montreal, Quebec, Canada, to Standard Oil Development Co., Del.

Auto top material comprising a fabric coated with rubber and a layer of cured polyhydric alcohol-polybasic acid resin type varnish containing aluminum powder. No. 2,062,469. Russell Morgan, Fairfield, Conn., to du Pont, Wilmington, Del.

Process for hardening mastic surfaces by applying to the damp aqueous emulsion of mastic a mixture of dry hydraulic cement and metallic particles. No. 2,062,615. Edward W. Scripture, Jr., to The Master Builders Co., both of Cleveland.

Soluble cutting oil composed of hydrocarbon oil, emulsifying base and a sulfurized base. No. 2,062,652. Louis A. Herrmann, Jersey City, N. J., and Theodore G. Roehner, Malverne, N. Y., to Socony-Vacuum Oil Co., N. Y. City.

Specialty Patents concluded on next page.

*Patents covered in this issue include those appearing in the *U. S. Patent Gazettes*, November 24 to December 15.

† Trade-marks reproduced and described cover those appearing in the *U. S. Patent Gazettes*, November 24 to December 15.

Specialty Patents (Concluded)

Polishing compound for plastic articles containing 16 parts wood fragments, 2 parts light lubricating mineral oil and 4 parts of powdered pumice. No. 2,062,671. Joseph Lupo, Jr., Bronx, N. Y.

Weed killing compositions containing certain mercurated fatty substances. No. 2,062,823. Anderson W. Ralston and Carl W. Christensen to Armour and Co., both of Chicago.

Process for producing colored stone by blasting colored pigments into the stove and covering with a transparent waterproof coating. No. 2,062,865. John Harry Coleman, Elizabeth, N. J., to The Warner Chemical Co., N. Y. City.

Building plate comprising 25% asbestos fibre and 30% to 40% each of lime and of active silica. No. 2,062,879. Alphonse Hammenecker, Marickerke, Belgium, to The Ruberoid Co., N. Y. City.

Insecticidal composition containing a salt of Reinecke's acid as an active ingredient. No. 2,062,911. Morris S. Kharasch, Chicago, to du Pont, Wilmington, Del.

Adhesive sizing compound containing lupine bean flour, caustic soda, zinc sulfate pigment, bentonite, vegetable gelatine, para-formaldehyde, clay and water. No. 2,062,942. Oreste Scalise and David Coleman, N. Y. City.

Heat resisting cement containing from 60 to 70% exfoliated vermiculite, 20 to 30% fire clay and ½ to 2% hair. No. 2,063,102. Otis L. Jones, assignor of one-half to The Illinois Clay Products Co., and one-half to F. E. Schundler & Co., all of Joliet, Ill.

Lubricating composition containing from 0.10% to 5% by weight of a naphthene sulfonic acid salt of a heavy metal dissolved in mineral lubricating oil. No. 2,063,473. Chester Tietig, Kenton Hills, Ky.

Process for fusing rosin and polyvinyl ester for use in the manufacture of impregnated fibrous bases for shoe stiffener parts. No. 2,063,649. Frank O. Woodruff, Newton, Mass., to Beckwith Mfg. Co., Dover, N. H.

Asphalt paints containing gilsonite, a "gas-proofed" oil of the class consisting of tung and oiticica oils and mixtures thereof, a metallic drier, and a thinner. No. 2,063,669. Thomas C. Ford to American Asphalt Paint Co., both of Kankakee, Ill.

Method of making a grinding wheel from abrasive grains, rubber and Thermoprene. No. 2,063,685. Merton B. Lane, Holden, Mass., to Norton Co., Worcester, Mass.

Method of stiffening shoe uppers by adding an uncooked amylaceous substance to a fibrous stiffener blank, exposing the blank to a steam atmosphere to cook, and proceeding promptly with forming operations. No. 2,063,690. Stanley P. Lovell, Newton, Mass., to Beckwith Mfg. Co., Dover, N. H.

Paving material composed of shell and a bituminous product. No. 2,063,893. Willie L. Holbrook and William R. Parker, Houston, Tex.

Fluid-circulating cleaning composition consisting of water, a mineral oil and either inhibited sulfuric acid or hydrochloric acid containing an organic base separated from mineral oils. No. 2,063,972. Elmer Wade Adams and Thomas Hunton Rogers, Hammond, Ind., to Standard Oil Co. (Ind.), Chicago.

Dielectric liquid comprising a mixture of the halogenated derivatives of benzotrifluoride. No. 2,063,979. Harold S. Booth, Cleveland Heights, Ohio, to Westinghouse, E. Pittsburgh.

Adhesive suitable for installation of linoleum, etc., consisting of 27 to 35% alcohol-soluble oxidized drying oil, 6 to 8% rosin, 35 to 40% of a filler, and approximately 25% alcohol. No 2,064,139. Frank M. Allen, Summit, and Walter S. Egge, East Orange, N. J., to Congoleum-Nairn, Inc., N. Y.

Leather cleaning composition consisting of saponified oleic acid, which has had the iron removed, and a dry cleaning solvent. No. 2,064,285. Wallace J. Yates, Martinez, Calif., to Shell Development Co., San Francisco.

Glue base consisting of an intimate mixture of an alkali soluble, reactive, thermo-setting phenolic resin powder with sodium metasilicate. No. 2,064,410. Albert Henry Bowen to I. F. Laucks, Inc., both of Seattle, Wash.

Detergent composition for the removal of cellulose lacquer and stains from the skin. No. 2,064,725. Waldemar Blech, Cleveland, to Thurlow G. Gregory.

Heat energizable cement comprising nitrocellulose, a highly plastic synthetic resin and a solvent. No. 2,064,802. Donald E. Edgar, New Brunswick, N. J., to du Pont, Wilmington, Del.

Sapolin Co., N. Y. City, maker of paints, varnishes and enamels, has appointed E. T. Howard Co., N. Y. City, as its agency.

381,294

381,297

381,477

Thoroughbred

381,775

NOBS

381,824

ELEKTRIT

381,890

Liquid Thread

382,098

FOS-FO-TEX

382,167

PHARMOL

382,490

Saladino's 77

382,322

382,512

CHEMONITE

382,525

ROCRETE

382,652

382,806

ANTI-TERMITE
"ELEN"
L N

382,898

382,920

CHAMPIC

382,997

383,001

FULLERITE

383,113

383,157

REACTOLITE

383,226

ANTISEPTIZED

383,248

CREOLOL

383,256

606

383,277

VALVULINA

383,329

PET-ROLAX

Descriptions

381,294. Valentine & Co., N.Y. City; July 21,'36; paint and varnish remover; use since Mar. 7, '36.

381,297. Valentine & Co., N. Y. City; July 21, '36; paint enamel; use since Mar. 7, '36.

381,477. Joseph Donner (Thoroughbred Pharmacal Co.), Chicago; July 27, '36; shaving cream; use since June 1, '36.

381,775. Nobs Dehydrating Corp., Los Angeles, Calif.; Aug. 3, '36; chemicals used in dehydrating petroleum oils; use since June 15, '36.

381,824. United Carborundum and Electrite Works Co., Nove Benatky, Czechoslovakia; Aug. 4, '36; abrading and polishing grains and powders, wheels, etc.; use since 1900.

381,890. Chas. P. Coscia, Ptsbgh., Pa.; Aug. 5, '36; liquid paste andthread; use since Jan. 15, '36.

382,098. Monsanto Chem. Co., St. Louis, Mo.; Aug. 12, '36; sodium pyrophosphates and sodium pyrophosphate mixtures; use since Aug. 1, '34.

382,167. Pharma-Chemical Corp., N. Y. City and Bayonne, N. J.; Aug. 14, '36; dyes; use since June 28, '32.

382,490. Peter Saladino (Saladino Chemical Laboratory), Indianapolis, Ind.; Aug. 22, '36; cleaning, disinfecting, and deodorizing preparation; use since Jan., '32.

382,322. Sav-O-Silx Co., Los Angeles; filed Aug. 18, '36; liquid soap; use since Aug. 10, '36.

382,512. Aaron Gordon, Berkeley, Calif.; filed Aug. 24, '36; chemically treated lumber; use since Apr. 1, '36.

382,525. The Rohan Co., Garden City, N. Y.; Aug. 24, '36; composition construction and building material; use since July, '33.

382,652. American Lumber and Treating Co., Chicago; Aug. 28, '36; impregnated wood, protected against decay, etc.; use since June 8, '36.

382,806. J. Poutays, Bordeaux, Fr.; Sept. 1, '36 insecticides or vermin killer; use since Jan. 24, '34.

382,898. George T. Wood (Grace Mfg. Co.), Cincinnati, Ohio; Sept. 3, '36; gum-base polish; use since May 1, '36.

382,920. Les Parfums Chypron Societe Anonyme, Courbevoie/Seine, Fr.; Sept. 4, '36; shaving soap, toilet soap, etc.; use since Feb. 19, '36.

382,997. Addressograph-Multigraph Corp., Euclid Village, Cleveland; filed Sept. 8, '36; chemicals for use in planographic printing; use since Jan. '34.

383,001. Walter S. Baylis, Los Angeles; filed Sept. 8, '36; activated Fuller's earth for treating mineral and vegetable oils; use since June 10, '36.

383,113. Herman Weiss, Yonkers, N. Y.; Sept. 10, '36; water softeners; use since Sept. '32.

383,157. Walter S. Baylis, Los Angeles; filed Sept. 12, '36; activated Fuller's earth for treating and refining lubricating oils; use since Aug. 31, '36.

383,226. Rudolph Rebold, N. Y. City; Sept. 14, '36; insecticides, fungicides, etc.; use since Sept. 9, '36.

383,248. American Creolol Co., Latrobe, Pa.; filed Sept. 15, '36; germicides, disinfectants, deodorants, and insecticides; use since Dec. 20, '97.

383,256. Philip Carey Mfg. Co., Lockland, Ohio; filed Sept. 15, '36; thermal insulating cement; use since Apr. 4, '32.

383,277. Valvoline Oil Co., Cincinnati and N. Y. City; filed Sept. 15, '36; lubricating oils and greases; use since Aug. 31, '36.

383,329. Sterling Products Co., Easton, Pa.; Sept. 16, '36; paste soap for petroleum solvent system; use since Aug. 29, '36.

383,330
Painticator

383,331
FIL-TROLAX

383,341
HORMOSAN

383,372
TENOL

383,374
ULTROIL

383,407

383,414
DUCO 7 WAX

383,453
CYLREX

383,454
SETINE

383,478
RESINWELD

383,617
CALCIMAG

383,524

383,567

383,622
WYEX

383,654

383,667
AGFANOL

383,369
FINOL

383,369
CONCENTAL

383,726
LUSTRAL

383,719
CODI'S
REX STAR

383,727
RELION

383,732
HYPODOL

383,779
CLORINSE

383,827
FLO

Descriptions

383,330. Sterling Products Co., Easton, Pa.; Sept. 16, '36; solvents for removing oil, tar, paint, etc.; use since Aug. 29, '36.

383,331. Sterling Products Co., Easton, Pa.; Sept. 16, '36; fluid dry cleaning soap; use since Aug. 29, '36.

383,341. Merck & Co., Rahway, N. J.; Sept. 18, '36; chemical compounds to stimulate plant growth; use since Sept. 1, '36.

383,372. Sinclair Refining Co., N. Y. City; Sept. 17, '36; lubricating oil; use since Aug. 15, '36.

383,374. Paper Makers Chemical Corp. to Hercules Powder Co., both of Wilmington, Del.; filed Sept. 17, '36; sulfonated castor oil; use since Apr. 1, '30.

383,407. Roxalin Flexible Lacquer Co., Elizabeth, N. J.; Sept. 18, '36; lacquers, enamels, etc.; use since May 14, '36.

383,414. DuPont, Wilmington, Del.; Sept. 18, '36; prepared wax for painted surfaces; use since May 26, '31.

383,453. Socony-Vacuum Oil Co., N. Y. City; Sept. 19, '36; lubricating oil; use since Dec. 15, '33.

383,454. Socony-Vacuum Oil Co., Inc., N. Y. City; Sept. 19, '36; oils used in leather manufacture; use since Jan. 1, '06.

383,478. George H. Osgood, Tacoma, Wash.; Sept. 21, '36; glues and glue bases; use since July 1, '36.

383,617. Basic Dolomite, Inc., Cleveland; filed Sept. 25, '36; prepared mineral ingredients for use in glass batch mixtures; use since June 25, '36.

383,524. Frisch & Co., N. Y. City; Sept. 23, '36; ready mixed paint; use since Jan. 1, '35.

383,567. Bangs Products, Linden, N. J.; Sept. 24, '36; furniture polish, bar polish, and floor wax; use since Aug. 1, '36.

383,622. J. M. Huber, Inc., N. Y. City; Sept. 25, '36; carbon black; use since July 6, '36.

383,654. Socony-Vacuum Oil Co., N. Y. City; Sept. 25, '36; refined petroleum oil for heating, lighting, etc.; use since Sept. 14, '36.

383,667. Agfa Ansco Corp., Binghamton, N. Y.; Sept. 26, '36; photographic chemicals; use since Sept. 3, '36.

383,668. Agfa Ansco Corp., Binghamton, N. Y.; Sept. 26, '36; photographic chemicals; use since Sept. 3, '36.

383,369. Paper Makers Chemical Corp. to Hercules Powder Co., both of Wilmington, Del.; filed Sept. 17, '36; sulfonated tallow for use as a foam killer and as a softener and finisher in textile manufacturing; use since Dec. 20, '34.

383,726. Laboratorios Soliris, S. A., Habana, Cuba; Dec. 14, '35; bottle washing compound; use since March, '25.

383,719. James Codispoti (Codi Laboratories Co.), Pittsburgh, Pa.; Sept. 28, '36; preparation for cleaning, bleaching, and disinfecting; use since July 13, '36.

383,727. The Daversey Corp., Chicago; Sept. 28, '36; bottle washing compound; use since March, '25.

383,732. Georgia-Carolina Oil Co., Macon, Ga.; Sept. 28, '36; lubricating oils and greases; use since Aug. 15, '36.

383,779. Paper Makers Chemical Corp., Wilmington, Del. to Hercules Powder Co., Wilmington; Sept. 29, '36; compound of chloramine T and sodium bicarbonate for use as germicidal wash; use since June 3, '36.

383,827. Sterling Products Co., Easton, Pa.; Sept. 30, '36; fluid dry cleaning soap for use in petroleum systems; use since Aug. 24, '36.

Conference on Pest Control

The Dept. of Entomology of Purdue, Lafayette, Ind., will hold a conference for pest control operators, Jan. 18-22nd. This conference is being held at the special request of Indiana pest control operators and in cooperation with the National Association of Exterminators & Fumigators.

The purpose of this initial conference or short course is to provide information dealing first of all with the fundamentals of insect life and other animals and insect control which is the basis of all pest control operations; also, to provide a clearing house for all interested in pest control to the end that the business may continue along the high ethical lines for which the National Association of Exterminators & Fumigators stands. The course is open to all and complete details are available from secretary William O. Buettner of the association at 3019 Fort Hamilton Parkway, Brooklyn, N. Y.

Next Convention in Memphis

The next convention will be held during the latter part of October 1937, at Memphis. The National Association Committee will be announced shortly but for chairman of the Local Memphis Convention Committee, Louis Kotler of Orkin Exterminating has been appointed. His address is 619 Exchange Bldg. Decision was also made as to convention cities for 1938 and 1939. Los Angeles has been chosen for '38 and N. Y. City for '39.

The National Association of Exterminators & Fumigators is continuing to give serious thought to the question of changing the official name of the organization.

Northwestern Fumigators Meet

The annual meeting of the Northwestern Association of Exterminators and Fumigators was held Nov. 27th at Cafe Exceptionale, St. Paul, Minn. Election of officers for the ensuing year took place: Max J. Levy, president; Wm. O'Reilly, vice-president; E. H. Leitte, treasurer; H. V. Smith, secretary; R. Vannes, director; and F. L. Casey, director.

Unfair trade practices were discussed with emphasis as to stabilizing prices in connection with fumigation operations. Committee appointed to make a study of this matter is composed of Messrs. Leitte, Vannes, and O'Reilly.

California Spray Labels

Rotenone flysprays and those containing thiocyanates, as well as pyrethrum sprays, may be labeled, at least until June 30, 1937, as "non-injurious when used as directed," under the California insecticide law, according to information given to John H. Wright, secretary of the National Association of Insecticide and Disinfectant Manufacturers, by Dr. Aivin J. Cox, chief of the chemical division of the California Dept. of Agriculture.

383,828
KLEN -OLAX

384,102
Aero Mobiloil

384,328
HERCAMON

383,838
ERGANIL

384,127
EFFLOR

384,421
DIA-MO-NEX

383,888
TREMOLINE

384,152
MACO

384,466
RINO

383,889
SANAROMA

384,205
SUPER FILTROL

384,488
DU-TONE

383,899
GOLD CREST

384,505
NOWY-NAMEL

383,911
NEUFULITE

384,224
PURITYPE

384,540
FILTOFOAM

383,924
ATLAS

384,292
TI-SIL

384,659
HERESITE

384,000
ACITROL

384,293
TI-TINT

384,679
PROTO

384,001
PERLITEX

384,320
Raymura

384,709
ALUMICHROM

384,103

384,366
SRO

384,637
KCN CA-SE-IN

385,122
VIBROGEL

Descriptions

383,828. Sterling Products Co., Easton, Pa.; Sept. 30, '36; fluid soap for use in wet cleaning process as practiced in dry cleaning plants; use since May 27, '36.

383,838. General Dyestuff Corp., N. Y. City; Oct. 1, '36; leather dyes; use since July 5, '33.

383,888. W. H. Loomis Talc Corp., Gouverneur, N. Y.; Oct. 2, '36; tremolitic talc for ceramic industry; use since '32.

383,889. The Mabex Co., Philadelphia, Pa.; Oct. 2, '36; insecticides; use since June 15, '35.

383,899. Sears, Roebuck and Co., Chicago; filed Oct. 2, '36; motor lubricating oil and grease; use since Mar. 17, '34.

383,911. Walter S. Baylis, Los Angeles, Calif.; Oct. 3, '36; activated Fuller's earth for treating animal and vegetable oils; use since Sept. 16, '36.

383,924. Charles L. Gane (Atlas Supply Co.), Philadelphia, Pa.; Oct. 3, '36; pastes, glues, adhesives, etc.; use since Apr. 1, '08.

384,000. E. F. Houghton & Co., Philadelphia; Oct. 5, '36; pickling compounds for removing scale from steel; use since Sept. 25, '36.

384,001. E. F. Houghton & Co., Philadelphia; Oct. 5, '36; carburizers for liquid baths used in the treatment of steel; use since Sept. 25, '36.

384,103. Socony-Vacuum Oil Co., N. Y. City; Oct. 7, '36; lubricating oils; use since May 2, '34.

384,102. Socony-Vacuum Oil Co., N. Y. City; Oct. 7, '36; lubricating oils; use since May 2, '34.

384,127. Mario Cappello (The Efflor Co.), Boston, Mass.; Oct. 8, '36; ammonia, germicide, disinfectants, and bluing; use since Feb. 6, '36.

384,152. American Maize Products Co.; N. Y. City; Oct. 9, '36; prolamin material from corn gluten for manufacture of plastics and adhesives; use since Sept. 19, '36.

384,205. Filtrol Corp., Los Angeles; filed Oct. 10, '36; chemically treated bentonite; use since Apr. 30, '36.

384,224. James A. Westhaver, Malden, Mass.; Oct. 10, '36; pig lead, bearing metal, solder and type metal; use since June, '34.

384,292. Krebs Pigment & Color Corp., Wilmington, Del.; Oct. 13, '36; paint pigments; use since Feb. 25, '36.

384,293. Krebs Pigment & Color Corp., Wilmington, Del.; filed Oct. 13, '36; paint pigments; use since July 22, '35.

384,320. M. Ewing Fox Co., N. Y. City; Oct. 14, '36; water paint; use since June 5, '36.

384,366. The Barrett Co., N. Y. City; filed Oct. 15, '36; oil used in the processing and treatment of rubber; use since Oct., '29.

384,328. Hercules Powder Co., Wilmington, Del.; Oct. 14, '36; nitrate of ammonia blasting agent; use since Sept. 29, '36.

384,421. Industrial Abrasives, Chicago; Oct. 16, '36; abrading elements; use since Aug. 10, '36.

384,466. Hordel Co., N. Y. City; Oct. 17, '36; toilet bowl cleaners; use since Oct. 1, '35.

384,488. H. Kirk White & Co., Oconomowoc, Wis.; Oct. 17, '36; glass cleaner; use since Sept. 1, '33.

384,505. Capitol Paint & Varnish Works, Chicago; Oct. 19, '36; paint enamel; use since Sept. 16, '36.

384,540. David B. Lesser (Benzofoam Products Co.), Chicago; Oct. 19, '36; dry cleaning soap; use since Jan. 1, '10.

384,659. Heresite & Chemical Co., Manitowoc, Wis.; filed Oct. 22, '36; varnishes, baking enamels and synthetic resin; use since Dec. 17, '35.

384,679. L. Sonneborn Sons, Inc., N. Y. City; filed Oct. 22, '36; lubricating oils; use since Jan. 22, '27.

384,709. W. H. Kemp Co., N. Y. City; Oct. 23, '36; aluminum paint; use since Oct. 14, '36.

384,837. American Artists' Color Wks., Brooklyn, N. Y.; filed Oct. 27, '36; concentrated paste paint; use since Oct. 15, '36.

385,122. Hercules Powder Co., Wilmington, Del.; filed Nov. 4, '36; high explosive; use since Sept. 9, '36.

Du Pont Appeals Bruce Suit

Du Pont is appealing the E. L. Bruce Co. suit. Latter company is located in Memphis and used a stainer on lumber made by the former. Du Pont states that the stainer was represented as being in the experimental stage at the time of purchase by the plaintiff.

Lever Broadcasts Help Charity

Lever Bros. devoted a large part of the company's broadcasting periods last month to aid local organizations collecting old toys for distribution to needy children at Christmas.

Manhattan Soap On the Air

Manhattan Soap (Peck Advertising Agency) will begin a two-a-week, 15-morning network series Jan. 13th.

U. S. Paint Exports

World demand for American paint products continues to increase with export shipments now going forward each month to approximately 100 foreign markets. Value in October aggregated $1,561,000 compared with $1,375,000 during the preceding month and $1,241,000 in October, '35.

Foreign shipments of ready mixed paints, varnishes and lacquers were valued at $586,000 in October with every item on the list registering increases compared with October, '35, during which month the value was recorded at $489,650.

Pigment Shipments Up

Exports of chemical pigments from the U. S. totalled 15,783,000 lbs. in October, compared with 10,540,500 lbs. in October, '35, value increasing from $595,780 to $849,300. In this group exports of carbon black increased from 8,669,750 lbs. to 13,442,000 lbs.

While mineral earth export shipments declined in quantity, total for the month being recorded at 2,923,400 lbs. compared with 5,897,200 for October, '35, value received increased from $38,350 to $44,800.

Colgate Pushes Kirkman's Soap

Colgate-Palmolive-Peet, which recently appointed N. W. Ayer & Son to handle advertising for Kirkman's soap, has started a 5-a-week morning radio program for this product. A newspaper campaign also is planned.

CHEMICAL

NEWS & MARKETS

Frank C. Whitmore, President-elect A. C. S. and also the Nichols Medalist.

ISCO

Caustic Potash

FLAKE • SOLID • GRANULAR • BROKEN
WALNUT *also* LIQUID

Various packages

Carbonate of Potash

Domestic

CALCINED 98-100%—99-100%
HYDRATED 83-85% • LIQUID 47-48%

The uniformly high quality of ISCO Domestic Carbonate of Potash has resulted in its wide adoption in place of the Imported article.

Caustic Soda

Prime 76%

SOLID • FLAKE • CRYSTAL • LIQUID (Tank Cars)

In various packages

Prompt shipment of all these products from ample stocks maintained at convenient points throughout the country—also direct from our plant located at Niagara Falls, N. Y.

Chloride of Lime

(Bleaching Powder)

Our quality and service kept us sold up well ahead on this commodity right through 1936. Present signs point to a similar condition in 1937. We urge our friends to cover their needs well in advance—and to assure themselves complete satisfaction by sticking to ISCO Chloride of Lime.

Requests for samples, quotations and further information will receive prompt attention.

Are you receiving our bulletin, the ISCO NEWS? It contains timely information of value to users of industrial chemicals. If it is not reaching you regularly, write us to add your name to our mailing list.

INNIS, SPEIDEN & CO.

Industrial Chemicals since 1816

117-119 LIBERTY STREET, NEW YORK

BOSTON • PHILADELPHIA • CLEVELAND • CHICAGO • GLOVERSVILLE, N. Y.

'36 CHEMICAL TRADE EXPANDS

Despite Trade Barriers, Currency Devaluation, and Self-Sufficiency Policies, International Exchange of Chemicals and Raw Materials Reached the Highest Level Since '28—U. S. Registered the Greatest Improvement—

International trade in chemicals and related products was definitely better in 1936 and the outlook for the new year is probably the best since 1928, T. W. Delahanty, acting chief of the Commerce Dept's. Chemical Division reports in a summary of '36 international chemical trade. While all major chemical producing nations reported better foreign business in such lines during the year, the U. S. appears to have made the greatest progress.

The trend towards national self-sufficiency that has been noted in many countries during recent years continued unabated in 1936, with many countries, particularly in Europe and the Far East redoubling their efforts in that direction.

Many new chemical factories were reported under construction in central and eastern European countries and the Italian Government issued a long list of permits for the construction and extension of chemical plants. In the Far East Japan continued to expand its chemical production facilities at a rapid rate. In South America, however, comparatively few new chemical plants were reported during the year while in Central America the number totalled less than 10.

U. S. the World's Largest Importer

The U. S. continued to hold its position as the world's largest importer of chemicals and industrial oils and increased its purchases of such materials approximately 25% to a total of $145,000,000 during the year, according to estimates. Fully 90% of the materials imported consisted of raw and semi-manufactured products destined for industrial consumption.

As a chemical exporter the U. S. was second—being exceeded only by Germany. Chemical products valued at approximately $155,000,000 were shipped out of the U. S. during the year with practically every country of the world buying more than it did in 1935, according to Commerce Department statistics.

German Sales Up 6%

Despite the many handicaps arising out of exchange, shortage of raw materials, and other difficulties, German chemical manufacturers were able, during the first 9 months of the year, to increase sales of their products to foreign countries about 6% to a total of $200,000,000 compared with the same period of 1935. In accomplishing this, exporters resorted to many ingenious devices, most successful of which, perhaps, was barter—potash being traded to Egypt for onions, medicinals going to Chile for nitrates, etc. The German exporters also received substantial government assistance in the form of equalization bonuses which were designed to enable them to meet competition anywhere.

Germany's chemical imports likewise increased 6% to a total value of $65,000,000 during the first 9 months of the year, despite Government efforts to keep such purchases at a minimum, and notwithstanding the rapid progress made by chemists in synthesizing products which were formerly imported.

English Exports Fail to Expand

England's chemical exports were recorded at approximately $92,000,000 during the first 9 months of the year, showing little change from the January-September period of 1935, but imports advanced some 7% in value to a total of $74,000,000, preliminary statistics reveal.

Japanese Progress is Slower

Japanese chemical exporters failed to maintain the progress that has been recorded by that country during recent years. Its chemical exports valued at $23,000,000 during the first 9 months of the year were only 3% higher than for the same months of '35 but the value of imports advanced sharply to $41,000,000—a 30% increase over similar receipts during the January-September period of the preceding year. A part of this increase was due to higher price levels.

While Japanese exporters were unable to maintain the rapid progress enjoyed during the past 3 years, they did, however, extend their activities in Africa and nearby Far Eastern markets, and made some gains in the Western Hemisphere.

U. S. Imports $122,000,000 in 10 Mos.

A total of $122,000,000 worth of chemicals and related products were imported during the first 10 months of the year against receipts of such materials valued at $98,000,000 in the corresponding months of 1935, preliminary statistics show. Of the 1936 total (on a value basis) around 30% consisted of industrial chemicals; fertilizer materials made up 24%; drying oils, 19%; crude drugs and their derivatives, 13½%; and gums, resins, and waxes, 9½%, analysis shows.

Imports of industrial chemicals aggregated $17,216,000 in value during the 10-month period of 1936 compared with $13,475,450 in the corresponding months of the preceding year. In this classification imports of crude glycerine increased from 7,434,000 lbs. to 8,763,000 lbs.; refined glycerine from 68,350 lbs. to 2,202,000 lbs; crude iodine from 376,000 lbs. to 592,000 lbs.; and camphor including both natural and synthetic from 2,943,500 lbs. to 4,520,000 lbs., statistics show.

Imports of drying oils advanced sharply both in quantity and value during the year, the former increasing 25% while the latter due to higher price levels, particularly for Chinese tung oil, increased more than 60%, estimates indicate. The value of such imports during the first 10 months of the year aggregated $23,103,000 compared with $14,175,000 in the corresponding months of '35. In quantity, receipts of tung oil increased from 101 to 120 million lbs. and Manchurian and Japanese perilla from 67 to 118 million. Very little linseed oil was imported in either period but receipts of flaxseed declined from 14,616,000 bu. in the first 10 months of '35 to 11,170,000 for the 10-month period of the year just ended.

All categories of fertilizer materials, except potash, were imported in greater quantities during the year just ended. Total receipts of these materials aggregated 1,265,880 tons during the first 10 months of the year, compared with 1,081,800 tons for the corresponding months of '35 and the invoice value rose from $22,375,000 to $27,515,000, according to preliminary statistics. Receipts of nitrogenous materials increased from 611,000 to 871,760 tons, while potashes declined from 392,690 to 294,090 tons.

Other items on the import list recording substantial gains over the 10 month period of '35 included carnauba wax, receipts of which increased from 8,908,400 to 10,295,000 lbs.; vegetable wax from 3,882,800 to 5,125,000 lbs.; vegetable tallow from 23,300 to 2,760,000 lbs.; tankage from 24,050 to 41,862 tons; shellac and other varnish gums from 50 to 67 million lbs.; casein from 1,511,400 to 14,754,000 lbs.; and creosote oil from 31 to 32 million gals.

Our Export Trade Shows Expansion

During the first 10 months of '36 the total value of our chemical export trade aggregated $128,000,000 compared with $111,600,000 in the corresponding months of the preceding year, and $85,600,000 for the first 10 months of 1933.

Export demand during the year was especially good for chemical specialties, paints and varnishes, medicinals, soaps and toilet preparations, and spectacular gains were recorded in shipments of sulfur and fertilizers.

During the first 10 months of the year a total of $35,400,000 worth of industrial chemicals and chemical specialties were exported from the U. S. with practically every country of the world taking a share.

Our sulfur export business staged a remarkable recovery in '36. Shipments to foreign countries during the first 10

months aggregated $9,630,760, against $6,344,000 in the corresponding period of 1935. In quantity, exports of crude sulfur increased from 318,482 to 481,950 tons and shipments of refined from 8,569 to 10,069 tons.

Tariff Commission's 20th Report

The Tariff Commission has just issued its 20th Annual Report covering the period ended Nov. 30, 1936. Report presents a brief resume of the work of the Commission during the 20 years of its existence. This history refers to the various changes during that period in the methods of tariff making and the experience gained by the Commission in the light of a close and practical acquaintance with tariff questions and the types of information required to assist in meeting them. As required by law, report includes summaries of the reports submitted this year. It discusses other completed work and important work under way. Recommendation is renewed again this year to have certain functions in cases of unfair practice transferred in part to the Courts and in part to the Federal Trade Commission because of overlapping.

Seek Support for Library

Leading chemical firms are contributing to the support of the Library of The Chemists' Club (N. Y.) as a result of a campaign now in progress to raise additional funds to modernize and bring up to date this valuable Library.

For more than 25 years, the Library has been open without cost to the chemical industry and the general public. Contributions from firms in the industry during the last few years have helped defray expenses but unfortunately it has been necessary to curtail the purchase of new volumes and even to discontinue some subscriptions.

Under the proposed plan of support, the Club will continue to house and assist in the support of the Library, but in view of the valuable service which the Library renders to the industry and to bring this service up to date and make it even more efficient, the various chemical companies are being asked to make annual contributions over the next 5 years. Requests for information concerning the Library or contributions to the Library Fund should be addressed to the Library Committee, 52 E. 41st st., N. Y. City.

Exports of Gums Increased in '36

Exports of natural gums from Netherland India have improved steadily during the current year, following several years of decline, according to a report from Batavia, which states that the U. S. has substantially increased purchases of Netherland copal and damar gum during 1936.

Weidlein Succeeds Bartow as A.C.S. President

Dean Whitmore Chosen as President-Elect—Midgley Receives the Perkin Medal—Other Personal News—

On Jan. 1st E. R. Weidlein took up his duties as president of the A.C.S. He is the director of the Mellon Institute of Industrial Research. He succeeds Prof. Edward Bartow, of the State University of Iowa.

MELLON'S E. R. WEIDLEIN

The new president of the A.C.S.

Dr. Weidlein was born in Augusta, Kansas, July 14, '87. He was graduated from the University of Kansas in 1909, and received the master of arts degree in '10. He was industrial fellow of the University from '09 to '12. He holds the honorary degree of doctor of science from Tufts College, '24, and of doctor of laws from the University of Pittsburgh, '30.

Dr. Weidlein became associate director of Mellon in '16, after serving 4 years as senior industrial fellow. In '21 he was named director. His research has been chiefly in the fields of heat insulation materials, hydrometallurgy, camphor, and epinephrine. Recently he has devoted himself to industrial research methodology.

Dr. Weidlein was chairman of the fuel committee of the National Research Council in '18, and is now a member of the Council's central petroleum committee and of its division of engineering industrial research. He was a chemical expert to the War Industries Board, 1918-1919.

A Former A.I.Ch.E. President

He is a past president and director of the American Institute of Chemical Engineers, and a fellow of the American Association for the Advancement of Science and the American Institute of Chemists. He is a member of the Society of Chemical Industry, the Electrochemical Society, the Franklin Institute, the American Institute of Mining and Metallurgical Engineers, and the Faraday Society, as well as of numerous other organizations in this country and abroad. He is a trustee of the University of Pittsburgh, and a director of the Forbes National Bank, Pittsburgh.

Whitmore is President-Elect

Dean Frank C. Whitmore of the School of Chemistry and Physics of Pennsylvania State College has been elected president of the A.C.S. for '38. He took office as president-elect on Jan. 1, '37.

Dean Whitmore was recently awarded the William H. Nichols Medal of the N. Y. Section "for his studies in metallo-organic compounds, especially those of mercury, and in the field of aliphatic chemistry, particularly in molecular rearrangements and in the polymerization of olefins." He will receive the medal, founded in '02 to stimulate original research in chemistry, at a ceremony on March 5th.

He was born in North Attleboro, Mass., Oct. 1, '87, and attended schools in Atlantic City, N. J. He holds 3 degrees from Harvard, the A.B., '11; the A.M., '12; and the Ph.D., '14. Before becoming dean of the School of Chemistry and Physics at Pennsylvania State in '29, he was instructor in organic chemistry at Williams College and at Rice Institute, assistant professor at the University of Minnesota, and professor and head of the chemistry department at Northwestern.

He is consultant and member of the Scientific Advisory Committee of the Chemical Warfare Service. He has held many offices in the A.C.S., starting with the treasurership of the Southeast Texas Section in '17, and including 9 years of service as a national director and 8 years as secretary and chairman of the Division of Organic Chemistry. He was vice president of the American Association for the Advancement of Science in '32 and has been chairman of its chemical section. He has also been chairman of the Division of Chemistry and Chemical Technology of the National Research Council and a member of other divisions of that organization.

Midgley is Perkin Medalist

The Perkin Medal for '37 was presented Jan. 8th to Thomas Midgley, Jr. of the Ethyl Gasoline Corp. at a joint meeting of the American Section of the Society of Chemical Industry and the A.C.S., held at The Chemists' Club, N. Y. City. James G. Vail, chairman, presided over the meeting. The program included a talk by Robert E. Wilson on the accomplishments of the medalist, presentation of the medal by Marston T. Bogert and delivery of the medal address by Thomas Midgley, Jr.

Mr. Midgley discussed the use of the periodic table in the research which led to the development of antiknock gasoline and organic fluoride refrigerants. His paper was entitled "From the Periodic Table to Production."

Other Names in the News

Dr. John V. N. Dorr, president of the Dorr Co., spoke before a joint meeting of the Providence Engineering Society and the A.C.S. last month on the subject of "Some Chemical and Metallurgical Reminiscences."

John R. Parsons, consultant in air analysis, addressed the N. Y. Chapter of the A.I.C. on Dec. 18th on the subject "The Chemist In Air Conditioning."

A. Lynn Ivey, V.-C., president, was elected to the board of directors of the National Association of Manufacturers at its 41st annual session in N. Y. City last month.

Percy C. Magnus has been re-elected president of the N. Y. Board of Trade.

Dr. Willard H. Dow, president, Dow Chemical, has been elected a director at large of the A.C.S. to succeed Dr. Milton C. Whitaker, Cyanamid.

Dr. E. K. Bolton, du Pont's chemical director, and Dr. C. E. K. Mees, Eastman Kodak vice-president and research director, have been elected A.C.S. councilors at large.

Arthur A. Backus, vice-president in charge of production of U. S. I. and U. S. Industrial Chemical, Inc. has just completed his 20th consecutive year of service.

William Perry, manager of the industrial division of du Pont's plastics department, has purchased Beverly, the 600-acre estate near Princess Anne where years ago plans were laid for the rescue of Napoleon from exile.

More than a century ago Jerome Bonaparte, then in Baltimore, plotted with Nehemiah King, owner of Beverly, to take Napoleon from exile on St. Helena and bring him to America. Napoleon's death brought the plot to an unexpected close.

H. V. Corey, American Cyanamid, has just returned from an extended business trip to the West Indies.

"On the Gangplank"

C. C. Concannon, chief of the chemical division of the Bureau of Foreign & Domestic Commerce, left on Dec. 18th for an extended trip through South America. He will return in the *Santa Maria* on Feb. 2nd.

Dr. Stanford L. Hermann, son of the president of Apex Chemical, and member of the research staff of that firm, has left on the *Saturnia* for a short holiday cruise to the West Indies. While in Cuba, it is understood that he will interview chemical firms and consumers already doing business with his organization, with a view to establishing better Latin American cooperation in that country.

M. L. Crossley, Calco's director of research, was in Europe on business last month.

Noah Van Cleef, of Van Cleef Bros., Chicago, Ill., was scheduled to sail on Dec. 8th in the *S. S. Monterey* for Australia and New Zealand where he will confer with the company's distributors.

Bass Returns to Mellon as Executive Assistant

Hitchcock, Nichols Copper, Retires—Higgins on Hercules' Finance Committee — Hostetter Leaves Corning Glass — Harrison, U.S.I., Retires—Other Personnel Items—

Dr. Lawrence Wade Bass has been appointed a member of the executive staff of Mellon Institute. Dr. Bass served as executive assistant at Mellon during the period 1929-31 and is returning to that organization as assistant director after being connected with the Borden Co. for 6 years, first as assistant director of research, then, since '32, as director of research. He assumed his duties at the Institute Jan. 1st.

DR. LAWRENCE W. BASS

He leaves Borden's to return to Mellon Institute, Pittsburgh.

Rice Succeeds Hitchcock

George P. Hitchcock, assistant secretary of the Nichols Copper Co., and since 1918 in charge of the sales of copper sulfate and other chemicals produced by the company, has retired. He plans to travel.

The sale of chemicals is now in the hands of Hugh M. Rice who has been western manager for the company for the past 10 years.

Higgins Takes Finance Post

C. A. Higgins, vice-president of Hercules Powder, has been elected chairman of the finance committee of the company to fill the vacancy caused by the death of J. T. Skelly.

Hostetter with Equipment Maker

Dr. John C. Hostetter, for many years director of Corning Glass' research, has been elected vice-president in charge of research and development of the Hartford-Empire Co., Hartford, Conn., makers of glass machinery.

Flynn Joins Oliver United Filters

Oliver United Filters appoints E. D. Flynn as chief engineer, with headquarters at Oakland, Calif. He will direct engineering for both the Oakland, California and Hazleton, Pa. factories. He is a graduate of the University of California and has been continuously associated with the Company since '17. His experience in the filtration field is very wide, comprising engineering, design, field service, sales and executive. His work has brought him in contact with all the major processing industries.

Flanagan with Patterson Foundry

Patterson Foundry & Machine, East Liverpool, Ohio, has appointed Victor E. Flanagan as sales engineer in charge of field work in pulverizing machinery sales. He was for a number of years connected with the mining machinery division of Allis-Chalmers, and was before that general manager of Diester Concentrator of Fort Wayne, Ind., having served also as assistant mill superintendent of N. J. Zinc's plant at Ogdensburg, N. J. and as construction engineer.

VICTOR E. FLANAGAN

Chemical makers will appreciate his experience and services.

In his new connection with Patterson, Mr. Flanagan will specialize in Patterson ball and tube mills and Patterson closed circuit grinding systems as used for both wet and dry grinding.

After 50 Years of Service

Marking close to a half century of service, Paul Harrison brought to a close Jan. 1st, one of the longest and most active careers in the alcohol industry. He retires as sales manager of the N. Y. division of U. S. I. and as president of James A. Webb and Son, a subsidiary company of U. S. I. He held in addition

CITRIC ACID

POTASSIUM CITRATE

SODIUM CITRATE

PFIZER QUALITY

MANUFACTURING CHEMISTS SINCE 1849

CHAS. PFIZER & CO., INC.

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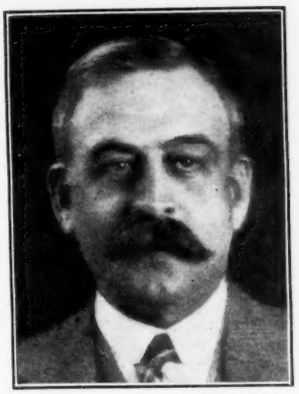
444 W. GRAND AVE.

directorships in the U. S. Industrial Alcohol Sales Co., James A. Webb and Son, and A. L. Webb and Sons.



U.S.I.'s PAUL HARRISON

By his retirement the alcohol industry loses an outstanding leader.

Mr. Harrison entered the alcohol field in 1890 when he joined the company of James A. Webb and Son.

In later years, as president of the Webb division, his advice and counsel were important factors in guiding U. S. I.'s destiny. He had an unparalleled opportunity to trace the evolution of the U. S. I. into the world's largest producer of industrial alcohol.

Others in New Positions

George J. Klein has joined Herron and Meyer, Inc., sales agents for General Atlas Carbon, makers of Gastex carbon black, where he will act as technical supervisor of the Gastex development work initiated by Dr. H. A. Winkelmann several years ago. Before joining the sales agents, Mr. Klein was head of the raw materials inspection and development dept. of B. F. Goodrich.

E. P. Strothman is appointed sales manager of the Ceramic Products Dept. of the A. O. Smith Corp.

P. J. Dapkus, chemical engineer, has joined the M. A. Bell Co., St. Louis, in the foundry core oil division.

The American Potash Institute is announcing the addition of Joe E. Walker to its staff as field agronomist in the Southwestern states.

A. T. Loeffler, who has for many years been associated with Hooker Electrochemical, resigned some time ago, and has accepted a position in Monsanto's N. Y. Office.

Known for many years as Number One salesman for industrial alcohol in the middle west, John W. Dunn, Detroit division manager, of U. S. I., retired Jan. 1st, after 18 years of loyal service.

Two National Lead branch managers have retired. O. H. Greene, St. Louis manager, and C. C. Foerstner, who acted in a similar capacity at Cleveland, ended their active connection with the company on Jan. 1st.

Gerald R. Brophy, well-known in metallurgical circles, has joined the development and research staffs of the Bayonne, N. J. research "labs" of International Nickel.

Leonard C. Cartwright, B.S., Ch.E., University of Florida '27, A.M. Harvard '35, has joined the staff of Foster D. Snell, Inc. Mr. Cartwright has had extensive experience in the industry as research, development and consulting chemist and engineer.

Philip J. Ehman, formerly with Continental Can, is now on Ansul Chemical's research staff at Marinette, Wis.

Julian M. Avery, electro-chemical and metallurgical engineer, formerly with Carbide, joins Arthur D. Little, Inc., research chemists and engineers of Cambridge, Mass.

Wayne R. Fuller, former technical director, Pratt & Lambert, has joined Devoe & Raynolds at Louisville as head of the industrial sales department. William H. Lutz with Pratt & Lambert since '27 has been made technical director.

W. Harlan Henszey, district manager of Patterson Foundry & Machine, Widener Bldg., Philadelphia, announces the appointment of George L. Anderson who becomes connected with that office as sales engineer. He has for 20 years specialized in the design, application and sales of process equipment.

Anaconda Sales announced the appointment of R. A. Jones as sales manager to succeed Lee Van Derlinden. Mr. Van Derlinden resigned Dec. 1st. Company also announces the transfer of the Chicago and Salt Lake City fertilizer sales offices to Anaconda, Mont.

Henry W. Erickson has resigned from Allis Chalmers Manufacturing and is now associated with Separations Engineering as vice-president and chief engineer.

E. J. O'Conner and L. J. LaCava have each been appointed assistant general managers of sales in the general line division for Continental Can.

Paul H. Cathcart, Cleveland representative for Titanium Pigment, is now a divisional sales manager with Jones-Dabney.

Du Pont Modifies Trade-Mark Policy

"Pontalite" to be Known as "Lucite"—Coins Phrase "Neoprene" as a Generic Term for Chloroprene Polymers—Turner Moves Headquarters to Ridgefield—Other Company News—

Due to recent trends in court decisions with respect to the generic use of trademarks, the du Pont Co. is modifying its policy somewhat regarding certain of its trade-marks now in use which embrace a syllable of the Company's present name.

Among other changes, the du Pont trade-mark "Pontalite" is being discontinued to designate the new methyl methacrylate resin manufactured by the du Pont Co., which was recently introduced to the trade and which has attracted wide notice.

The new methyl methacrylate resin manufactured by du Pont will be offered under the trade-mark "Lucite" instead of "Pontalite."

The word "neoprene" has been adopted as a generic term for the chloroprene polymers formerly sold by du Pont under the trade mark DuPrene, the company announces. This action is taken in order to provide manufacturers with a name which can be applied both to the unvulcanized material and to the products made from it, corresponding to the accepted usage of the word rubber. The new name neoprene will not be trade marked and may be freely used by rubber manufacturers to describe products which display the distinctive characteristics of this unique material.

Turner Has Big Moving Day

Joseph Turner & Co.'s local sales office is now located in the International Bldg., Radio City. The main office, formerly located at 500 5th ave., N. Y. City, has been moved to the new plant just erected at Ridgefield, N. J. The N. Y. City office is now in charge of Branch Manager Charles N. Hollwedel. John F. Henry, who has been connected with the firm for several years, is in charge of the N. J. territory. Walter Merrill, head of the firm, will make his headquarters at Ridgefield.

New Nemours Bldg. Opened

The explosives department had the honor of being the first department to move into the new Nemours Building in Wilmington, Del. It will occupy the 5th, 6th and 7th floors. The organic chemical department moved in on Dec. 21st and will be located on the 9th floor. The publicity department is also located on the same floor. The ammonia department will occupy the 10th floor; the plastics department will have quarters on the 11th floor. The twelfth floor will house the Krebs Chemicals Department.

These changes will provide space in the Du Pont Building for the expansion and centralization of departments which are now seriously over-crowded.

Increases Acid Capacity

Standard Wholesale Phosphate & Acid Works, South Baltimore, Md., has started construction on a 3-story building which will cover a space 112 by 450 feet and will afford room for the doubling of the acid making capacity of the old factory.

NATIONAL ANILINE

INDUSTRIAL CHEMICALS

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A comprehensive line of Coal-Tar Derivatives serving the following Industries:

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NATIONAL QUALITY

INTERMEDIATES

Priorities, the house organ of the Prior Chemical Corp., 420 Lexington ave., N. Y. City, will appear for January in a very novel form—a color wheel. It is a cardboard wheel in black and white which when spun on the end of a pin or paper clip proves the contention that color itself is not a substance but a sensation. The Prior Chemical Corp. is the sole selling agent for Standard bichromates, and in addition, is sales agent for several other producers of industrial chemicals.

J. T. Baker Chemical, Phillipsburg, N. J., prominent manufacturer of fine and industrial chemicals, gave Christmas bonuses to 240 employees.

Cataract Chemical, Buffalo, has leased a building in Fort Erie, Ontario, to make leather tanning chemicals for the Canadian and British trades.

Wishnick, Tumpeer has been forced to take larger space for its Boston office at 141 Milk st., W. C. Weller is in charge.

Kaolin, Inc., Spruce Pine, N. C., is constructing a $40,000 plant in Averey County. H. K. Ferguson Co., Cleveland, is the builder.

Phillips & Jacobs, Philadelphia manufacturers and distributors of industrial chemicals, have given 2 weeks' salary as a bonus to employees.

Spurred by a dual desire to stimulate scientific development in the arc welding field, and to honor the pioneer work of its president in promoting arc welding and perfecting and developing arc welding equipment and electrodes, The Lincoln Electric Co. has just completed its long contemplated plans for establishing a Fund and Foundation to encourage study and research for benefit of the industry.

Initial output of du Pont's new plastic, Pontalite, will be 1,500,000 lbs. annually. This capacity can be doubled with minor plant changes when necessary.

Weaver Tankage's plant near Norfolk, Va., destroyed by fire will be rebuilt. Company is making shipments without interruption.

P. P. Huffard, president of National Carbon reports that the company plans immediate expansion of its Clarksburg works. This company has purchased the factory site formerly owned by Grasselli Chemical and at this location will erect a graphitizing plant.

The properties of Consolidated Chemical and Miner-Edgar Chemical are to be sold, according to a recent court order. The Miner-Edgar firm has been bankrupt since '33.

Pittsburgh Plate Glass has purchased an entire block at 5th and Ruskin aves., Pittsburgh, and will erect a research laboratory.

Solvay Process has raised the hourly wage pay from 5 to 10% at its Hopewell plant.

With the purpose of exploiting deposits of alum and sulfur, the Alum Properties Inc. of California is planning construction of a refinery plant of large capacity and has acquired properties formerly owned and operated by the Western Chemicals Inc. and other owners. The properties, formerly productive, have been idle for several years.

Dowell, Inc., is building a new $20,000 laboratory in Tulsa.

The Mifflin Chemical Corp. has been given back its alcohol permit.

The Mixing Equipment Co., Rochester, N. Y., reports that its N. Y. City offices are in larger quarters at 377 Broadway. C. F. Donahue is in charge.

Jefferson Lake Oil, sulfur producers, with headquarters in New Orleans, is moving its plant from Barba, La., to the Clemons dome in Brazoria County, Texas upper gulf coast. Erection of the plant at Clemons dome will begin immediately.

United Carbon's Chicago office is in a new location at 3037 So. Turner ave., with Charles M. Baldwin, manager.

Swift & Co. is planning the erection of a $750,000 oil refining plant in Newark.

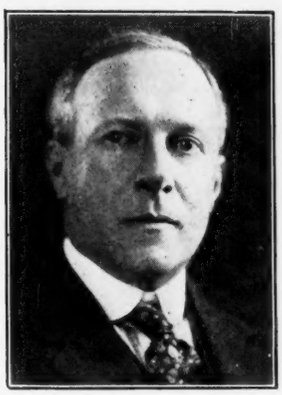
Monroe Manganese Mining Corp. has been formed to mine manganese in Monroe County, W. Va. H. L. Whitesell, Lowmoor, Va., is president.

Cabot Carbon is preparing to erect a carbon black plant in West Texas.

Merz Elected S.O.C.M.A. President for 10th Term

Francis P. Garvan Presents Him with Token of Appreciation from Association Members—Joseph A. Huisking is New Chairman, Chemical Section, N. Y. Board of Trade—Distributors Plan Permanent Organization—

August Merz, Calco, has been re-elected president of the S.O.C.M.A. In a token of appreciation for the service he has rendered the organization as president for the past 9 years Francis P. Garvan in behalf of the members presented Mr. Merz with a beautiful desk-set at a dinner on Dec. 8th.



CALCO'S AUGUST MERZ

He receives a desk-set from the organic chemical makers.

Dinner Date Set for Mar. 4th

At a meeting of the newly elected executive committee of the Drug, Chemical and Allied Trades Section of the N. Y. Board of Trade, held Dec. 1st, at the Drug and Chemical Club, the following officers were elected for the ensuing year: chairman, Joseph A. Huisking, Charles L. Huisking & Co.; vice-chairman, August A. Wassercheid, Mallinckrodt; treasurer, S. Barksdale Penick, S. B. Penick & Co.; secretary, Ray Schlotterer, N. Y. Board of Trade.

Date for the annual dinner of this group was also decided upon. This will be held next year on Thursday, March 4th, '37, at the Waldorf-Astoria, and will be known as the 12th Annual Drug, Chemical and Allied Trades Banquet.

Dealers Discuss Association

Distributors of industrial chemicals in the Metropolitan area and also representatives of several other concerns in various parts of the country met at the Building Trades Club, N. Y. City, last month and discussed the possibility of forming a permanent association. Another meeting is planned for sometime in January.

A Record Crowd Attended

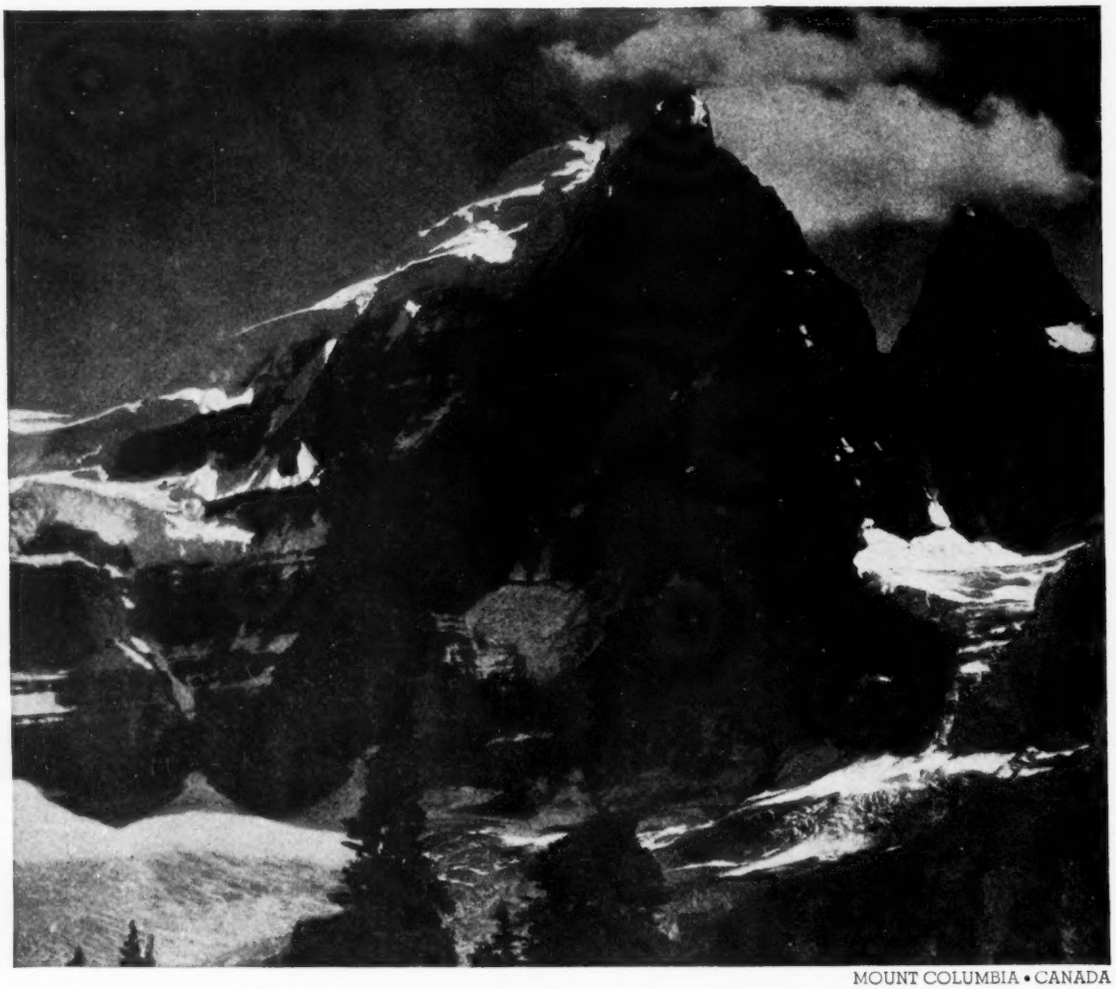
The 15th annual Christmas Party of the Salesmen's Association of the American Chemical Industry held at the Park Central, N. Y. City, on Dec. 29th attracted a record crowd of nearly 300. At the noon business luncheon the following nominating committee for '37 was elected:—Victor Williams, Monsanto; Walter Merrill, Joseph Turner & Co.; Oscar Linn, Dow Chemical; William Barry, Mallinckrodt; S. Moody, Calco; Ira Vandewater, of R. W. Greeff & Co., and Richard Quortrup, Barrett.

Slate for Phila. Chemical Club

The nominating committee of the Chemical Club of Philadelphia has offered the following slate of officers to the members for 1937:—president, Lyman S. Lloyd, Alex Fergusson Co.; vice-president, Wm. R. Cleary, The Barrett Co.; secretary, Geo. B. Heckel, Jr., *Drugs, Oils and Paints,* and treasurer, Webster Rice, J. T. Baker Chemical.

To Talk Before Conn. A.C.S.

Dr. H. L. Bender of Bakelite Corporation's research and laboratory staff of Bloomfield, N. J., will deliver an address on March 26th, before the Western Connecticut Section of the A. C. S. Subject of Dr. Bender's talk will be "Resinous Plastics" in which he will cover the technical aspects of the present commercial resin field.



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AMMONIUM HYDROXIDE, C. P.
AMMONIUM PHOSPHATES
AMYL ACETATE
ANTI-OXIDANTS
AROCLORS
BELT CEMENT
BENZOTRICHLORIDE
BENZOYL CHLORIDE
BENZYL CHLORIDE
BONE ASH
BRONZING LIQUIDS
BUTYL ACETATE
CALCIUM PHOSPHATES
CALCIUM PYRO PHOSPHATE
CALCIUM SULFATE
CAUSTIC SODA
CEMENTS
CHLOR PHENOLS
CHLORINE, LIQUID
CHROME SULFATE
COTTON SOLUTIONS
CRESOLS
CYCLINE OIL
DEPILATORY
DETERGENTS
DIACETONE ALCOHOL
DIBUTYL PHTHALATE
DICHLORANILINE 1:2:5
DICHLORPHENOL
DIETHYL PHTHALATE
DIMETHYL PHTHALATE
DINITRANILINE
DINITROCHLORBENZENE 1:2:4
DIPHENYL
DIPHENYL PHTHALATE
DOPES (Lacquers)
DRY ICE
FERRISUL (Ferric Sulfate)
FERRO PHOSPHORUS
FIXALT
GLAUBER'S SALT
H ACID
HYPOCHLORITE OF SODA
INHIBITORS
LACQUERS
LAMPBLACK
MALEIC ANHYDRIDE
MERTANOL (Syntan)
MERTEC (Acid and alkali resistant paint)
METACHLORANILINE
METANITROCHLORBENZENE
METHYL SALICYLATE
MOLD PASTE
MONOCHLORBENZENE
MONSANTO SALT
NITRATE OF IRON
NITRE CAKE
NITROBENZENE
NITRO-CELLULOSE SOLUTIONS
OIL OF VITRIOL
ORTHO AMINO DIPHENYL
ORTHOANISIDINE
ORTHOCHLORANILINE
ORTHOCHLORPHENOL
ORTHODICHLORBENZENE
ORTHONITRANILINE
ORTHONITROCHLORBENZENE
ORTHOPHENETIDIN
PARA AMINO DIPHENYL
PARACHLORANILINE
PARACHLORPHENOL
PARADICHLORBENZENE
PARANISIDINE
PARANITROCHLORBENZENE
PARANITROPHENOL
PARAPHENETIDIN
PARATOLUENESULFONAMID
PARATOLUENESULFONCHLORIDE
PENETRANTS
PERCHLORIDE OF IRON
PHENOL
PHOSPHATES
PHOSPHOROUS OXYCHLORIDE
PHOSPHOROUS TRICHLORIDE
PHTHALIC ANHYDRIDE
PLASTICIZERS
PYRIDINE
RESINS
SALICYLIC ACID
SALT CAKE
SANTOLITES (Resins)
SANTOSITE (Sodium Sulfite)
SODIUM ACETATE
SODIUM ALUMINATE
SODIUM BISULFITE
SODIUM PHOSPHATES
SODIUM SULFIDE
SOLVENTS
SPREADING AGENTS
SULFUR
SULFURYL CHLORIDE
TANNING CHEMICALS
THINNERS
TRICRESYL PHOSPHATE
TRIPHENYL PHOSPHATE
WATER TREATING CHEMICALS
WETTING OUT AGENTS
XANTHATES
. . . AND OTHERS

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St. Louis, U.S.A.

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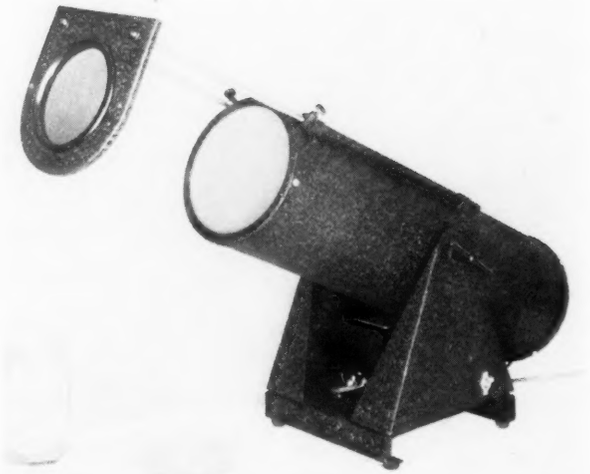
CHEMICAL

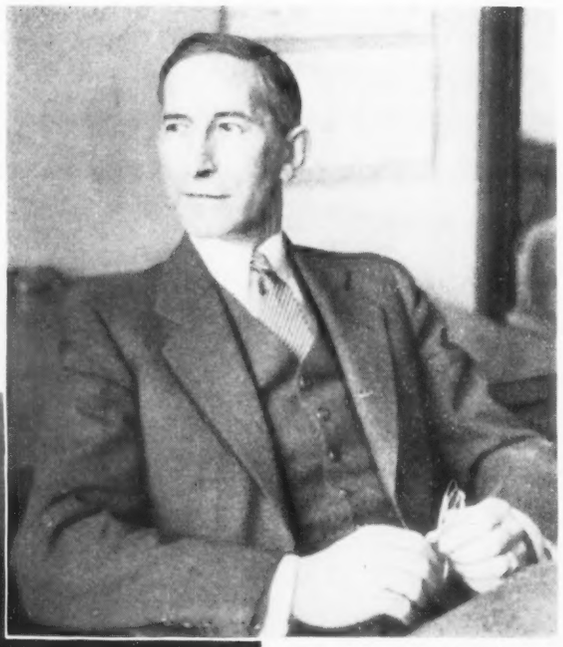
The Photographic Record

Dow Chicago staff at the new office opening last month. Top, K. M. Wilds, assistant manager; below, left, Wilson I. Doan, Chicago manager, and William Harris, insecticide sales.

Below, Carleton Ellis, who contributes to our patent symposium this month and whose new book is scheduled to appear at an early date.



The Strain Detector, new type of polariscope, manufactured by the Polarizing Instrument Co., New York City, employs the principle of transmitted polarized light opposed to reflected light, for the detection of strain in glass, and provides the observer with a large area of inspection, of uniform darkness and at the same time an inexpensive apparatus that is small, compact, portable, and easily and quickly set up for use. Its present application is made possible by the use of "Polaroid" glass.



A rival of ours for your reading time is E. R. Manchester, editor of that outstanding house organ, the "du Pont Magazine."

Lady, take a bow! Elisabeth B. Stroud, editoress of the "Hercules Mixer," which has just completed its eighteenth volume—though she doesn't look it.

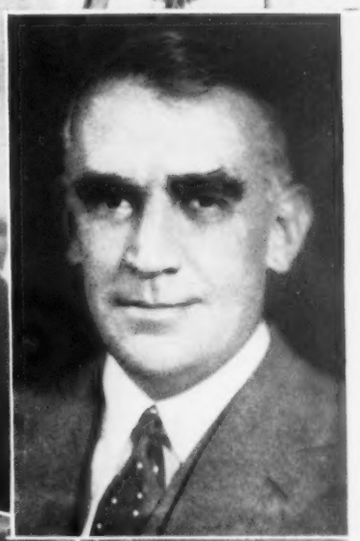
A constructive factor in the local chemical jobbing world was removed by the death of George Stanley Robins in Saint Louis.

NEWS REEL

of Our Chemical Activities

Men of Monsanto

Top row, left to right, Edgar M. Queeny, president; E. J. de Pree, production; Theodore Sill, sales; Charles Belknap, executive vice president. Center row, left to right, John W. Livingston, vice president, production; H. M. Harker, sales; Lynn Watt, development; Gaston du Bois, vice president, research.



Bottom row, left to right, D. S. Langreck, East St. Louis plant; G. Lee Camp, vice president, sales; J. A. Berninghaus, sales; and I. J. Stanley, sales.

TRANSPORT SHOCKS.....

Challenged

SAFE ARRIVALS are assured by "NATIONAL" STEEL PAILS.

- Present your merchandise in these hardy, shock-proof Containers.
- Constructively *unbeatable!* —"NATIONAL" STEEL PAILS consistently survive road-shocks and "treat-em-rough" handling.
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Round Table for Enamelers

The first annual Enamelers Round Table Conference, to be sponsored by the Porcelain Enamel Institute, will be held next May at the University of Illinois.

New Welding Research Planned

Plans to expand its organization for the advancement of welding research are announced by the Welding Research Committee of the Engineering Foundation, of which Prof. Comfort A. Adams of Harvard University is chairman.

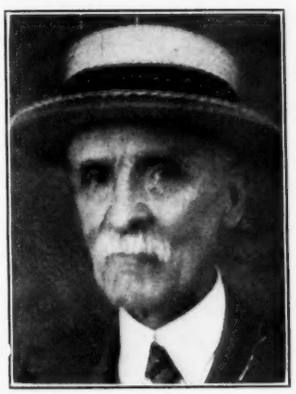
Mid-West Chemists Form Group

The Minnesota Industrial Chemists' Forum is a newly formed organization with the following officers:—Harry E. Rice, Consolidated Printing Ink, president; R. P. Mattern, Minneapolis-Honeywell Regulator, first vice-president; F. L. Buchanan, Waldorf Paper Products, 2nd vice-president; R. F. Sheahan, Thompson-Hayward Chemical, secretary, and J. H. Kugler, Minnesota Mining & Manufacturing, treasurer.

Thomas Bell, Chemical Pioneer, Dies in 84th Year

Former Lennig Treasurer Widely Known in Industrial Chemical Circles—Tweed, Popular Advertising Executive, Dies After Long Illness—Cincinnati Chemist Dies Saving Lives of 40 Workmen—

Thomas Bell, 84, a former treasurer of Charles Lennig & Co., died on Dec. 6th. He was born in Philadelphia, and at the age of 20, entered the employ, as salesman, of Charles Lennig, one of the oldest manufacturers of heavy chemicals in America. In 1914 he became a member



THOMAS BELL

of the board of directors of Charles Lennig & Co., being appointed assistant treasurer, and becoming treasurer in '24. He retained this office until his resignation in August, '32.

All who knew Mr. Bell—and his friends in the industry and among consumers of heavy chemicals in the area surrounding Philadelphia were many—had an affectionate regard for him. He was a veteran of the heavy chemical industry and his memory went back to the very early days, when manufacture was in its infancy and many of the commonest chemicals were imported from Europe. Mr. Bell's reminiscences of these early days were always interesting, and he himself, with a certain old world charm and grace of manner, savored of these former days.

Mr. Bell, in spite of his 84 years, was active and alert, and a frequent visitor to the firm's offices up till a short time before his death. Mr. Bell was unmarried and for many years made his home with his sister, who died in April, 1934, and with his twin brother Robert, to whom he was deeply attached, and who preceded him in death by only a few days.

Ralph E. Tweed, founder of the advertising agency of R. E. Tweed Co., Philadelphia, died on Dec. 24th, following an illness of 9 months. His company had several accounts in the chemical field. One of the outstanding of these was the Sharples Solvents' account.

A Hero's Death

Fred Thamann, 38, Cincinnati research chemist working on methods of preventing lead poisoning, died Dec. 17th in an effort to shut off a stream of hydrogen sulfide. He saved the lives of 40 working in the laboratory.

Other Deaths of the Month

William Campbell, 60, noted Columbia professor of metallurgy, died on Dec. 15th of a heart attack.

Dr. Dana P. Weld, 43, head of the research laboratory of Socony-Vacuum, on Dec. 15th.

Sales of chemicals and allied products increased 19.7% in November over the same month in '35, according to the Marketing Research Division of the Bureau of Foreign and Domestic Commerce.

Seasonal Decline in Chemical Shipments

Several Large Industrial Chemical Producers Report 12-15% Gains in Sales in '36—Successful Contract Season Nearly Over—Copper Sulfate Advances Sharply—Sulfur Production Up 22½%—

December industrial chemical tonnages declined seasonally from the October-November high point, but were substantially ahead of the volume shipped in the same month of '35. Prevalence of strikes in many of the heavy consuming lines, notably glass, helped to reduce shipments temporarily. Producers, however, feel that such tonnages will be regained early in the first quarter of '37. Chemical manufacturers are well satisfied with the volume of business in '36 and several companies have reported that their increases have reached 12 to 15% above '35 totals.

The contract season was a very orderly one considering the number of problems that were injected into the situation by the passage of the Patman Bill. While a small percentage of the contract business still remains unsigned, the overwhelming majority of consumers have signed "on the dotted line," Both sellers and buyers have shown a remarkable willingness to cooperate in efforts to comply not only with the letter but the spirit of the law.

Numerous Price Changes

Quite a large number of price changes were reported last month. Most of them, however, reflected adjustments in l. c. l. schedules. The rapid advance in metallic copper forced several rises in blue vitriol and an increase in lead acetate was forced by the sensational advances in the lead market. The most important price changes made in December are given above.

Important Price Changes

	Dec. 31	Nov. 30
ADVANCED		
Antimony metal	$0.13¼	$0.12⅜
Oxide	.13	.12¾
Bordeaux mixture	.10	.09½
Copper metal	.12	.10½
Copper sulfate	4.55	4.15
Lead acetate	.11½	.11
Magnesium chloride	39.00	36.00
Tin Tetrachloride	.26¾	.26½
Trisodium phosphate:		
Bbls.	2.05	1.95
Bgs.	1.85	1.75
DECLINED		
Aluminum hydrate	$0.029	$0.04
Ammonia, drs.	.02¼	.02½
Tks.	.04½	.05
Tank wagon	.02	.024
Arsenic (white)	.03	.03½
Disodium phosphate:		
Bbls.	1.90	1.95
Bgs.	1.70	1.75
Potassium carbonate:		
Calc.	.06½	.07¼
Hyd.	.05½	.06
Liquid	.02⅞	.03½
Sodium stannate	.34	.34½
Tin crystals	.38½	.39

2,000,000 Tons of Sulfur in '36

While complete production figures for the entire year 1936 are not yet available it is estimated that the total output of American sulfur mines will be approximately 2,000,000 tons. This will be an increase of 367,410 tons over the 1,632,590 tons produced in '35, or approximately 22½%.

E. M. Allen, formerly with the development laboratory of Columbia Alkali, is now with Wishnick, Tumpeer.

Quotations on Important Intermediates Revised

Declines Outnumber Advances—Benzol Firmer—Coke Production Expands Further—Concern Felt Over Automotive Labor Troubles—Naphthalene Statistics Released—

Demand for coal-tar chemicals held up remarkably well in December, a month in which a substantial decline in shipments is usually noted. However, many of the larger consuming industries, notably the rubber and automotive fields were extremely busy.

Producers of coal-tar acids and intermediates in announcing '37 contract prices disclosed several important price changes, with declines outnumbering the advances. The firm tone in cresylic has continued unchanged. The price schedule on phenol has been adjusted slightly for the current year. Producers report increasing demands from the plastics field.

The labor situation in the automotive centers is causing the manufacturers of coal-tar solvents considerable concern. At the moment no surpluses exist in toluol, xylol, and solvent naphtha, but a complete tie-up of the industry by labor leader Lewis and his CIO would result in a serious disarrangement of production and shipment of the more important solvents.

The situation in benzol has become much brighter. Demand has improved steadily over the past several weeks and the price structure appears to be much firmer. At the moment most of the improvement in demand appears to be coming from the rubber and chemical industries.

In a price readjustment on paraformaldehyde the quotations are given as 34c f.o.b. works on 1,000 lbs. or more, and 35c for quantities between 100 and 900 lbs. No special prices are now offered for very large quantities although large users will pay no more this year than during '36 because of the fixing of the price at 34c. The schedule for hexamethylenetetramine, technical, is now 35c per lb. f.o.b. works for 1,500 lbs. or more, 36c for 150 to 1,350 lbs. U.S.P. is now quoted at 46c f.o.b. works or N. Y. City for 500 lbs., and 47c for 100 to 400 lbs.

Important Price Changes

	Dec. 31	Nov. 30
ADVANCED		
Acid Gamma	$0.85	$0.80
Creosote oil	.113	.125
Dinitrotoluol	.14½	.15½
Metanitroparatoluidine	1.45	1.40
DECLINED		
Acid Broenner's	$1.11	$1.16
Acid Cleve's	.50	.52
Acid Laurent's	.45	.46
Acid Sulfonic	.17	.18
Acid Tobias	.65	.52
Alphanaphthol	.52	.60
Alphanaphthylamine	.32	.33
Aniline	.15	.16½
Benzidine base	.70	.72
Betanaphthylamine	.51	.53
Diethylaniline	.50	.52
Dimethylaniline	.26	.29
Dinitrotoluol	.14½	.15½
Ethylbenzylaniline	.86	.88
Metaphenylenediamine	.80	.82
Nitrobenzene	.08	.08½
Orthodichlorobenzene	.05	.06½
Orthotoluidine	.14	.14½
Paranitroaniline	.45	.47
Paratoluidine	.56	.58
Schaeffer's Salt	.46	.48
Sodium picramate	.65	.67

Coke Production Expands Further

For 4 consecutive months production of coke has shown an advance over the preceding month. Total output of byproduct and beehive coke for October amounted to 4,307,849 tons, or 140,094 tons per working day, the highest rate recorded for the year. In comparison with September, the October rate increased 4.6%. Gain was in part attributable to continued activities in the iron and steel industry, where the October daily rate of production, amounting to 96,512 gross tons, was the highest attained since the early months of '30. For the 10 months of '36 coke production has amounted to 37,420,040 net tons, a gain of 31.3% over the corresponding period of '35.

Output of byproduct coke for the 31 days of October was 4,071,249 tons, or 131,331 tons per day. Compared with September, the rate advanced 2.8%, the gain being shared almost equally by furnace and merchant plants. One plant resumed making coke after an idleness of more than 4 years.

Stocks of coke at byproduct plants at the close of October were 7.3% less than at the beginning of the month. Bulk of the decrease occurred at furnace plants, where reserves were decreased by 11.1%.

A small gain marked the production of coke during November. Daily rate of output from byproduct and beehive ovens, amounting to 144,546 tons, was 3.2% greater than the October rate of 140,094 tons, and was 34.1% above the rate prevailing in November a year ago. Output of byproduct coke for November amounted to 4,048,492 tons, or 134,950 tons per day, an increase of 2.8% when compared with October recovery. Gain was shared almost equally by merchant and furnace plants.

Stocks at byproduct plants continued to shrink, total on hand at the end of November aggregating 1,805,774 tons, a decrease of 4.3% when compared with the amount on hand at the beginning of the month. Bulk of the decrease occurred at furnace plants, where stocks were depleted by 10.3%.

Situation in Naphthalene

While prices are firm, the excitement which prevailed for several months in the past year has largely subsided.

Domestic production, imports, and consumption since '26 have been as follows:

Crude Naphthalene: Relation of Production to Imports

(Thousands of pounds)

Year	Domestic prod.	Imports	Apparent consumpt.	% Consumpt. supplied by imports
'27	53,325	6,577	59,902	11
'29	39,263	35,007	74,270	47
'31	20,934	30,971	51,905	60
'33	30,621	42,786	73,407	58
'34	37,922	47,995	85,917	56
'35	47,653	48,455	96,108	50
'36*	70,000	35,000	105,000	33

* Estimated.

All Lead Pigments Advanced Sharply

Statistical Position of Lead Suggests Possibility of Still Higher Pigment Prices — Chrome Green and Chrome Yellow Advanced—Naval Stores Restriction Program Likely—

After two weeks of heavy purchasing the markets for raw paint materials quieted down very noticeably in the final half of the month. Buyers appeared anxious to close out the year with comparatively small inventories, but an early revival of interest is anticipated for the paint output in '37 gives every promise of even topping the desirable volume of last year.

Outstanding in the markets, of course, were the general advances made in all of the lead pigments. Some of the latter, such as lead sulfate, have not had a price revision in two years and with the metal rising steadily producers have had no alternative but to revamp the price structure into line. Important price revisions were also announced last month in French ochre, metallic brown, chrome oxide green, Persian Gulf red oxides, and chrome yellow. Casein and ester gums are at the highest price levels that have

Important Price Changes

	Dec. 31	Nov. 30
ADVANCED		
Casein, 20-30	$0.19½	$0.17
80-100	.20	.17½
Chrome green oxide	.20	.18½
Chrome yellow	.13	.12
Lead, blue	.06½	.06
Metallic paste	.20½	.20¼
Red, 95%	.085	.077
97%	.08¾	.0795
98%	.09	.082
White	.07¼	.07
Litharge	.07½	.067
Orange mineral	.11¼	.10½
Red, mercury oxide	1.49	1.39
DECLINED		
Blue, iron	$0.36	$0.37
Red Persian Gulf oxide	.04¼	.04⅝
Yellow ocher, French	.02¼	.02¾

prevailed for these items in several years and yet, according to most market authorities, further advances in both are more than likely during the first quarter.

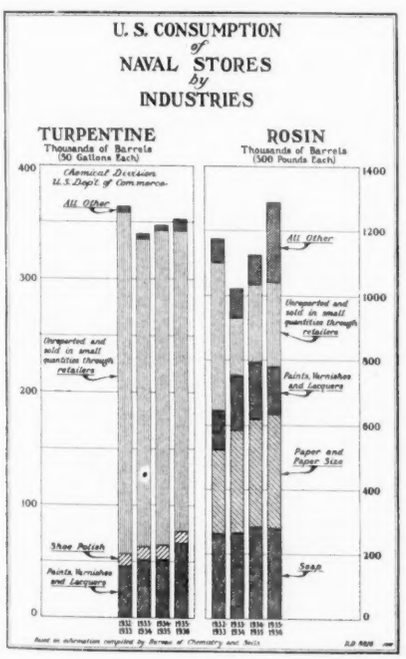
Minor changes in the l. c. l. carbon black price schedule were announced in the final week of the month. Blue prices were reduced as a result of much lower prices now prevailing for prussiates. Stearate manufacturers were booking business for the first quarter at unchanged prices as the year closed but a sudden rise in stearic acid makes it highly improbable that they will continue to offer material at existing levels. Several of the varnish gums were marked up in the last 30 days. Spot local stocks are in most cases very low and importers fear difficulty in getting shipments from abroad unloaded here as long as the shipping strike continues. Also, factors in the primary markets are impressed with the general rise in the quotations on most commodities and feel that new business should be based on higher price levels.

Shellac Markets Firmer

A similar feeling was reported in the primary centers for shellac and after several months of rather spotty prices a much firmer tone was noted both abroad and in the U. S. markets.

Naval Stores Again Advance

Further advances in naval stores prices were registered last month. Purchasing was fairly heavy in the first 3 weeks of



the month but tapered off considerably in the final week. The Department of Agriculture, it is reported, is ready to submit a definite plan of conservation to the naval stores group and within the industry there appears to be considerable sentiment in favor of the plan.

The government's holdings are now estimated at 90,000 barrels of turpentine and 135,000 barrels of rosin. There is very little difficulty attached to marketing the government's rosin holdings, but the release of the turpentine stocks might upset the turpentine market considerably.

The restriction plan for '37 is said to be aiming at 500,000 units, approximately the same production as this year's yield. Without the restriction, it is estimated that production would have run about 570,000 units. If the plan goes over well the government would experience very little difficulty in getting out from under its present holdings.

According to the details of the plan the government offers $1,710,000 as subsidies for the participation in the plan which is being operated as part of the forest conservation program. Last year about 65% of the producers cooperated and it is hoped 80% will join in the new plan. However, with prices soaring a strong temptation to producers to stay out of the fold exists.

Naval Stores Statistics Available

The 1936-'37 semi-annual report on naval stores, including figures on production, distribution, consumption, and stocks of rosin and turpentine, prepared by F. P. Veitch and C. F. Speh, Bureau of Soils, is now available from the Dept. of Agriculture, Washington, D. C.

Higher Paint Prices Likely

With the cost of most of the raw paint materials for the first quarter now known it is more than likely that the paint manufacturers will advance their prices approximately 5%. If this is done it will be the second advance in less than 60 days for most producers announced increases of from 3 to 5% in November. Further, paint manufacturers are not especially anxious to quote for more than 90 days in advance for they fear that still higher raw material costs are strong possibilities at the beginning of the second quarter.

Despite higher prices, however, the paint makers feel that '37 will be a banner year. It is stated that 80% of the buildings in the country are in need of some painting. This is one field that does anticipate an even greater percentage of gain in '37 than it enjoyed in '36.

December Automotive Output

Lacquer shipments in December were very heavy to the automotive field. December output is estimated to have reached 500,000 units. The outlook over the first quarter is entirely dependent upon the labor situation.

October-November Building

October residential building was 45% greater in volume than the recorded figure for October '35. According to F. W. Dodge Corp., October residential building total was $79,736,200 for the 37 eastern states as compared with $55,100,300 for October of 1935 and $80,670,800 for September of last year. Volume of nonresidential building in 37 eastern states amounted to $79,071,300 as compared with only $59,180,400 for this class of work in October '35 and $69,098,700 for September of the past year.

Heavy engineering (public works and public utilities) accounted for an additional construction volume in October of $67,032,400. Chiefly because of declines in public construction, heavy engineering jobs in October fell below their respective totals for either the previous month or October, '35. For all classes of construction, the October figure for the 37 eastern states totaled $225,839,900 and compares with $200,595,700 for October '35 and $234,271,500 for September of 1936.

It is apparent that construction, considering the volume for all types, will not make the percentage gains forecast by most observers some time ago, chiefly because of the decline in new government projects, but in a longer term sense the fact that emphasis is shifting to privately financed building is a good omen. Further, comparisons in coming months will suffer in comparison with corresponding months of last year for the simple reason that improvement set in seriously in the final quarter of '35.

Residential Building Expands

For the 6th time this year, the last 3 for consecutive months, the monthly volume of private construction has exceeded the total for public projects of every description. Reporting on construction in November, F. W. Dodge Corp. showed a total of $208,204,200 for the 37 eastern states covering both public and private jobs, as against $188,115,000 for November, '35 and $225,767,900 for October of last year. Of the November, '36 total about 58% represented private projects, remainder being public. For November, '35 private construction accounted for less than 40% of the total. Residential building during November in the 37 eastern states amounted to $68,440,700 as against only $39,695,200 for November, '35 and $79,664,200 for October last year.

'36 A Good Year for Paint Makers

Following the resumption of more normal production in the automotive, radio, furniture and other paint consuming industries, and with the revival of building and construction, particularly in the medium priced residential field, production and sales of paints, varnishes, and lacquers have gone ahead at a rapidly increasing pace since the beginning of the past year.

The successful promotion of "Save the Surface" and "Clean Up and Paint Up" campaigns throughout the country also has contributed to improved conditions in the paint and varnish industry by focusing attention of householders and business property owners upon the advisability of brightening up their properties. These

campaigns have not only resulted in heavier consumption of paints and varnishes but have enhanced property values as well.

Industrial and trade sales of paints, varnishes, lacquers, and fillers, reported by 579 establishments, aggregated $290,540,000 during the first three quarters of the current year, which is an increase of 13½% over the value of sales of similar products in the first 9 months of 1935 ($255,959,000) and only 17% under the high sales level attained ($348,800,000) during the corresponding quarters of '29, statistics gathered by the Bureau of Census indicate. The establishments which make regular reports to the Bureau of the Census account for approximately 80% of the domestic turnover of paints, varnishes, lacquers, and fillers.

Trade sales of paints, varnishes, and lacquers aggregated $113,186,000 during the first 3 quarters of the current year, compared with $102,162,000 for the corresponding months of 1935; industrial sales of paints and varnishes increased from $52,133,400 to $60,147,000; industrial sales of lacquers from $20,837,000 to $25,994,000; and unclassified sales from $80,826,000 to $91,213,600, the report shows.

Oils and Fats

Copra Hits New All-Time High in London—All Oils and Fats Move Higher—

Quotations on practically all important oils and fats advanced sharply in December. Copra and coconut oil continued to hold most of the spotlight. Quotations on copra in London reached a new all-time high and spot supplies of coconut oil in this country have become so scarce that all quotations are strictly nominal. Higher prices were registered in vegetable, fish, and animal oils and fats and it would be difficult to name an important oil that did not share in the general advance. Europe is desperately trying to buy back much of the oils and fats sold here early in '36. The uncertainty in shipping further aggregated the acute situation on supplies.

Improved Demand for Linseed

There has been a very marked improvement in the demand for linseed oil during the past few month. Reasons for such an increase are not difficult to find. A steady improvement in the building trades has led to a substantial expansion in the use of drying oils. With the exception of fish oil, linseed is at present the cheapest of all the oils used in the protective coating field. Even after the recent series of advances following strength in the Argentine flaxseed market, linseed oil selling at 9c a pound in bulk f.o.b. N. Y. is cheaper than soybean oil at 9½c Decatur basis, Perilla oil at 9½c Coast and China Wood oil at 12½c C.I.F. Pacific Coast. At the present rate of consumption this country will require well over 30,000,000 bushels of flaxseed annually to take care of the demand for linseed oil.

New Flax Development Committee

The Flax Institute of the U. S. has formed a sub-committee known as the Flax Development Committee, which is to function along the lines of an earlier organization bearing a similar name. It is the hope of the members of the newly formed committee that the economic necessity for a domestic flax crop can be brought home to growers in the districts in the Northwest where flax can properly be grown.

A Futures in Linseed?

Plans for opening a futures market in linseed oil on the N. Y. Produce Exchange have been announced but have not as yet met full official approval.

Good Demand for Tanning & Textile Specialties

'36 A Record Year for Shoe Production—Rayon Shortage Continues—Natural Tanstuffs Quoted Higher—Shortage of Egg Yolk Stocks Force 1c Increase—Japan's Rayon Output Tops U. S.

Despite clear indications that many buyers of textile and tanning chemicals and specialties were anxious to close out the end-of-the-year inventory period with stocks at a low point, the purchasing of these products was in exceptionally good volume in December. This situation was caused, of course, by the high rate of activity prevailing in both fields. It is quite evident that the shoe manufacturers have sufficient business booked to operate at a very high rate through the first quarter. Last year was a record one for the shoe and leather industries. Shoe production totalled approximately 410,000,000 pairs. Inasmuch as 80% of all leather is consumed by the shoe industry it is quite clear how improved conditions were last year for the tanners.

A somewhat similar condition prevails in most divisions of the textile field. The shortage in rayon still remains extremely acute. Deliveries of silk to American mills in November totalled 40,401 bales, a small decline from the 43,093 bales consumed in October, and the December figure is expected to show a still further drop. On the other hand, cotton consumption rose in November to 626,695 bales, the largest home mill takings for the month since 1927. Cotton spindles active during November numbered 23,805,520, compared with 23,638,270 during October this year and 23,193,538 during November last year. Some decline in consumption of cotton and spindle activity is thought to have occurred in December but the drop was but slight in the opinion of most authorities.

Tanstuffs in Short Supply

Most of the natural tanstuffs were priced higher last month. This was brought about because of the generally rising prices in commodities generally and also because local stocks are dwindling and the present shipping strike shows no signs of ending. Importers are fearful that they may experience considerable difficulty in getting replacement stocks into the country.

Important Price Changes

ADVANCED

	Dec. 31	Nov. 30
Egg yolk, imp.	$0.52	$0.51
Mangrove bark	26.00	25.50
Myrobalans J1	26.50	22.00
Valonia	48.00	46.00
Wattle bark	31.00	30.00
Zinc Dust	.0735	.0705

DECLINED

None.

Rayon Production Increases 15%

Rayon yarn shipments for '36 are estimated to have exceeded the '35 level by 15%, establishing a new all-time record. Producers will be forced to continue allotting yarn to customers throughout the first quarter.

Rayon production capacity will be augmented soon. Du Pont will almost double the present output of staple fiber at the Buffalo plant; Celanese will erect a large plant at Fall River, Mass.; and Viscose will erect a plant at Front Royal, Va.

Yet Japan, says the authoritative *Rayon Organon*, will outstrip the U. S. in production this year. An output of 325,000,000 lbs. is expected in Japan and while the U. S. output will exceed the previous year's figure it will not reach the Japanese total.

Cereal Chemists Elect

Kansas City Section of the American Association of Cereal Chemists has elected the following officers:—Chairman: Perie Rumold, Southwestern Milling, Kansas City, Kansas; vice-chairman: A. E. Curtis, Midland Flour Milling, Kansas City, Mo.; secy-treas: D. E. Colwell, Kansas State Grain Inspection, Overland Park, Kansas.

National Aniline has awarded contracts for construction of a large addition to its Buffalo factory.

Organic Ammoniates Advanced Sharply

Trading is Quiet in Most Raw Fertilizer Materials—Fish Scrap Quotations at Baltimore Nominal—Mixed Fertilizer Producers Expect 10% Tonnage Advance Next Season—Cyanamid Prices Are Higher—

The raw fertilizer materials markets were in the doldrums in the final month of the year. Most mixers have yet to start in a large way on '37 production. The markets were featured, however, by further advances in the organic ammoniates. Importers of these items are for the most part out of the market due to the fact that shipping conditions are uncertain. Much higher prices and lack of imported material will probably cause mixers to cut down noticeably on the amounts of organic ammoniates used in the coming season.

The Baltimore market for fish scrap was in a nominal state during most of the past month. Holders of stocks are said to be set on asking much higher prices and will refrain from making offerings until the active mixing season is well under way.

It is reported that some deliveries of California potash are being made by rail because of the shipping tieup both on the Coast and in certain of the Atlantic ports. Bone products are again advancing. Quotations on cyanamid have been raised in order to bring the item more in line with existing markets for sulfate and nitrate. The new prices are $1.05 for bagged material f.o.b. Atlantic ports and $1.10 f.o.b. Gulf ports or delivered at interior points.

Brighter Outlook in '37

The outlook for the fertilizer industry for '37 appears to be a bright one. An increase of 10% over last year's sales with a total tonnage of approximately 7,500,000 tons is said to be a fairly conservative estimate for season ahead. What is of still greater importance is the strong possibility that the price structure will hold up much better than it did in the past year.

16% Increase in November Sales

November fertilizer sales in 12 Southern states totalled 99,697 tons, an increase of 16% over November of last year and the largest volume reported for any November in at least 11 years. Sales in Florida accounted for about two-thirds of the total. In past years November sales in the South have been only about 2% of annual sales. In the first 5 months of the current fiscal year, from July through November, sales in the Southern States have been 24% larger than in the corresponding period of last year. They have also been substantially larger than in the same period of any recent year.

Important Price Changes

ADVANCED

	Dec. 31	Nov. 30
Blood, dom., Chgo.	$4.50	$4.25
Bone, raw 4½ and 50, Chgo.	23.00	22.00
Bone meal, dom., Chgo.	19.00	18.50
Cyanamid, Atl. Ports	1.05	1.03
Interior	1.10	1.07½
Hoof meal, Chgo.	3.00	2.85
Nitrogenous mat., West	3.50	2.75
East	3.50	3.00
Tankage, Chgo.	4.00	3.75
Dom., N. Y., grd.	4.25	3.85

DECLINED

None.

September-October Exports

September exports of fertilizer and fertilizer materials were under the corresponding month of last year, second consecutive month in which a decline took place. September exports totaled 168,843 tons valued at $1,434,888, representing declines of 28% in tonnage and 21% in value from September, '35. Most classes of materials were exported in smaller quantity in '36 than in '35, the principal exceptions being an increase in high grade hard phosphate rock and a continuation of the rise in potash exports.

For the first 9 months exports were 25% larger this year than last, with substantial increases occurring in ammonium sulfate, phosphate rock, and potash. Not much change has occurred in exports of synthetic sodium nitrate, superphosphate and mixed fertilizers.

October Totals Unusually High

Foreign trade in fertilizers and fertilizer materials in October was at an unusually high level. Not only were exports and imports substantially higher than in the preceding month but they were the largest recorded for any October in many years.

Exports totaled 194,237 short tons with a stated valuation of $1,969,970, representing increases of 7% in tonnage and 4% in value over October '35. Increase over 1935 was largely in exports of land pebble rock, accounting for the larger increase in tonnage than in value. Nitrogenous materials were exported in about the same volume last year as in '35, and potash exports were smaller.

For the first 10 months of the year exports exceeded the corresponding period of '35 by 22% and '34 by 38%. All of the more important materials were exported in larger quantity in the past year, with the largest gains occurring in ammonium sulfate, phosphate rock, and potash. Exports of potash have been 29% as large as potash imports; last year the ratio was 14%.

Import tonnage in October was more than twice as large as in the similar month of '34 and '35. Sharp increases in most classes of nitrogenous materials and in muriate of potash were largely responsible for the rise over '35.

Superphosphate Production Expands

In each of the last 8 months the aggregate production of superphosphate by acidulators who report their statistics to The N. F. A. has been larger than in the corresponding month of 1935. October production, which was 37% greater than in October of '35, was the largest reported for any month in several years. The seasonal trend is usually upward in November and December; if that trend was followed through '36 the 4th quarter output will be around a million tons. Increase in October as compared with 1935 was particularly marked in the Southern Area. For the first 10 months of the year the increase in production in the plants covered by the reports over the corresponding period of '35 amounted to 15%.

Potash Deliveries in 3rd Quarter

American Potash Institute announces that potash deliveries within the continental U. S., Canada, Cuba, Puerto Rico and Hawaii during the third quarter amounted to 93,327 tons of actual K_2O.

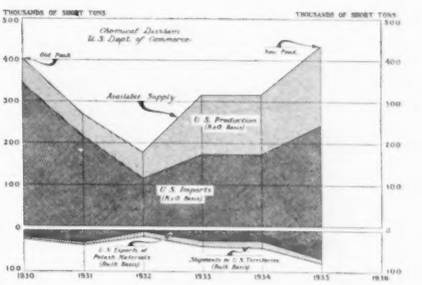


Chart shows the relative statistical position of domestic and import potashes.

This was equivalent to 170,456 tons of potash salts. Constituting this total were 133,461 tons of muriate, 9,843 tons of manure salts, 18,281 tons of sulfate, 7,268 tons of Kainit and 1,603 tons of sulfate of potash magnesia. These figures include salts of domestic and foreign origin, exclusive of importations of Potassium Nitrate.

For the 9 months (Jan.-Sept., inclusive), deliveries of K_2O amounted to 212,432 tons, equivalent to 412,385 tons of potash salts, consisting of 292,423 tons muriate; 39,697 tons manure salts, 39,106 tons sulfate; 36,983 tons Kainit; and 4,176 tons of sulfate of potash magnesia.

Senate Potash Investigation

The Senate potash investigating committee opened a series of meetings in Western States at Carlsbad, N. M., on Nov. 23rd.

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Committee will conduct investigations into production there and later at Searles Lake, Calif., and salt deposits along the Nevada-Utah border.

Investigation is to ascertain if potash can be made available to American farmers for fertilizer at less cost than has prevailed heretofore. Members of the investigating committee include Robert W. Wagner of N. Y., Henry P. Ashurst of Arizona, Carl A. Hatch of New Mexico and Robert D. Carey of Wyoming.

Whether the question of a tariff on potash will be brought up could not be ascertained. The domestic potash industry has grown tremendously and now produces more than 400,000 tons annually, and represents an investment of at least $20,000,000 in plant, equipment, and research.

World Potash Consumption

Total world potash consumption increased approximately 10% in 1935 to a new peak of between 2,250,000 and 2,300,000 metric tons, compared with a gain in world consumption of 30% in '34 and 20% during the preceding year, according to German estimates.

Triple Phosphate Not New

In discussing the general fertilizer situation, Charles J. Brand, executive secretary and treasurer of The National Fertilizer Association, has called attention to a series of newspaper clippings regarding the activities of the T. V. A. in the production and use of triple superphosphate as fertilizer. The statements in these clippings vary, but inferentially they were based on statements released by the Authority. Inquiry reveals that the Authority made no such statements, so that any inaccuracies can not be attributed fairly to that organization.

Mr. Brand stated, "Certain statements regarding triple superphosphate, made in a recent press agency release that has received wide publication, are so inaccurate and exaggerated and at such variance with the facts that they should not be allowed to remain uncorrected." He added that triple superphosphate is not a "new electro-chemical," and that electric furnaces are not necessary for its production. Factories for producing it by at least 4 different methods have been in operation from 5 to over 25 years by at least 6 different companies at 6 different locations in the U. S.

The electric furnace process for volatilizing phosphorus from phosphate rock was patented in 1889. Obviously it was not invented by the T. V. A., although its staff has devised valuable improvements.

Production of triple superphosphate does not "depend upon large quantities of cheap electricity to fire electric furnaces." Some 50,000 tons a year are made without the use of electric furnaces but by other well-known chemical processes. While the clippings state that "there isn't a pinch of triple superphosphate for sale," it is regularly on the open market, and its price quotations are published.

Mr. Brand pointed out that the distribution of erroneous information, such as that contained in the clippings, is very misleading to the farmer because it causes him to think that some panacea to cover all his plant food requirements has been discovered by the Government. It is also entirely unfair to the American fertilizer industry in that it gives the impression that the industry has been unprogressive and that a new fertilizer material has been invented by a Government agency which will revolutionize the entire industry.

NFA Studies Self-Government

The Board of the Association has requested further time for additional discussion of the trade practice rules submitted by the Federal Trade Commission. In many quarters it is felt that the present set-up does not have enough "teeth" in it to effectively prevent "cut-throat" price cutting, the ever-present problem of number one importance.

Industrial Alcohol Advanced 3¢ Per Gallon

Special Solvent is Also Higher—Chicago Tankwagon Prices of Petroleum Solvents Raised — Secondary Butyl Alcohol Reduced ½c—Rise in Use of Synthetic Resins Discussed—

With higher crude oil prices a strong possibility buyers of petroleum solvents were much more active in December than is usually the case at the year-end. According to those close to the market, users were building up reasonable reserves against a possibility of higher prices for refined products. In addition, several of the industries which are heavy petroleum solvent consumers operated at unseasonally high levels in December.

Important Price Changes

	Dec. 31	Nov. 30
ADVANCED		
Alcohol:		
Completely denat.	$0.33	$0.30
Special solvent	.27	.24
DECLINED		
Alcohol, butyl, sec. tks.	$0.07	$0.07½
Ethyl, pure	4.12	4.14
Butyl acetate, sec. tks.	.07	.07½
Ethyl methyl ketone, tks.	.06	.06½

Petroleum Solvents Steady

There have been no revisions in tank car quotations on petroleum solvents for several weeks at East Coast, Midcontinent, or Pacific Coast refineries. The only important price change was a general upward revision made in the final week of '36 in the Chicago schedule for tankwagon deliveries.

Alcohol Price Structure Firmer

In the first week of December the alcohol producers raised the schedules 3c for both completely denatured and special solvent, while at the same time pure was lowered 2c per gal. Special solvent is now based on a 27c price for tanks, and completely denatured is quoted at 33c for drums in carlot quantities. Reductions of ½c were reported in secondary butyl alcohol, secondary butyl acetate, and ethylmethylketone. A 5c reduction was reported for 91% isopropyl alcohol and a 10c reduction in the 98% grade.

Decentralization in Tire Industry

Suppliers of solvents and chemicals to the Akron rubber area are interested in the progress of the decentralization plans of several of the companies. Tire producers are rushing production to build up inventories in the next few weeks. Some curtailment of production is then looked for. It is expected that virtually all of the contraction will occur at the Akron plants alone while operations in the new plants in other states will be kept at a high rate.

Paint Makers' Use of Resins

U. S. consumption of synthetic resins, particularly by paint and varnish manufacturers, has increased considerably in recent years. Production passed the 100 million lbs. mark for the first time in '35 having more than doubled since '33. Fifteen years ago the output was less than 2 million lbs. per annum.

90% of Coal-tar Origin

Approximately 90% of all synthetic resins produced in the U. S. are of coal-tar origin, remainder being made of urea, waste gases, and other materials. Production of synthetic coal-tar resins aggregated 89½ million lbs. in '35, compared with 56 million during the preceding year and 41½ million in '33. A total of 64,641,000 lbs., valued at $12,191,000, was sold to other manufacturers in '35, the remainder being consumed by the producers. About 53% of all coal-tar resins produced in '35 were used in the manufacture of paints, varnishes, and lacquers, two-thirds of which consisted of "alkyd resins" and one third "tar-acid resins," according to estimates.

TVA's Muscle Shoals fertilizer plant has been shut down for several weeks for repairs and because of low water.

Seasonal Rise in Consumption of Pharmaceuticals

Increase in Influenza Cases in Several Sections Reported—Tartaric Acid Declines ¾c—Mercurials Advanced—End of Mercury Cartel Reported—

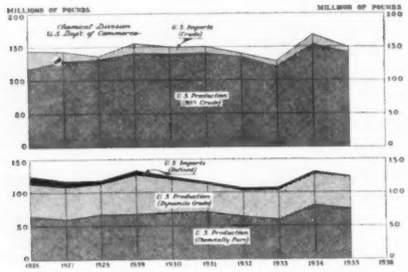
With a definite rise in respiratory ailments producers of pharmaceuticals were reported shipping out large quantities of acetylsalicylic acid and similar products. While the quotations on mercury remained unchanged most of the mercurials were advanced sharply to bring quotations more in line with the higher cost of the metal which has prevailed now for several months.

Important Price Changes

	Dec. 31	Nov. 30
ADVANCED		
Calomel	$1.40	$1.32
Corrosive sublimate	1.20	1.14
Mercury oxide, yellow, U.S.P.	1.91	1.81
Red precipitate	1.74	1.64
Rochelle salt	0.14½	0.14
Seidlitz mixture	.11½	.11⅜
Silver nitrate	.33	.32⅞
White precipitate	1.70	1.66
DECLINED		
Acid Lactic U.S.P.	$0.42	$0.45
Acid tartaric	.22¾	.24
Cream of tartar	.15	.16¾

Important Price Changes Reported

Tartaric acid was reduced ¾c in the 3rd week of the month; cream of tartar was also down. Rochelle salt, on the other hand, was advanced 1c and Seidlitz mixture was "upped" ⅞c. A 3c downward revision was announced in the last month for U.S.P. lactic acid. A slight lowering in the silver bullion market caused a small decline in silver nitrate.



Statistical situation in glycerine shown graphically.

The glycerine market in the past 30 days was a rather quiet affair when comparison is made with conditions earlier in the past year. Rather unexpected was a 2c reduction in pure ethyl alcohol.

Mercury Stocks Dwindling

The mercury situation was somewhat of a puzzle last month. On the basis of the available supply the item should have advanced but the demand dropped off with the result that suppliers failed to post higher prices. In the trade, however, it is felt that any sudden improvement in demand will be immediately reflected in much higher prices. Conflicting reports continue on the subject of the continuance of the Spanish-Italian mercury cartel. At the moment it seems to make little difference because the Spanish factors are completely out of the market.

Spanish Situation Unchanged

Despite the arrival of a few thousand flasks from Spain by way of Cuba the supply of quicksilver is inadequate. No further shipments are expected from Spain and world requirements must be largely supplied by Italy. No further advance was made in the price last month but unless the situation changes very rapidly the trade believes that still higher price levels will be forced upon domestic consumers. To "add further fuel to the fire" domestic quicksilver producers are finding it difficult to ship by water out of Pacific ports because of the shipping strike. Unsettled conditions abroad have also had a strengthening effect on several other raw materials so that the price structure generally is expected to point higher in the next few months.

Warns Against Foreign Purchasing

Foreign nations are draining the U. S. of its supply of quicksilver, vital munitions ingredient, Maj. Myron B. Goldsmith, U. S. Army Reserve, warns in the current issue of *Western Mining News*. However, factors in the quicksilver market declare that this situation does not exist. In the final analysis the trend in the future depends largely on how quickly or how slowly the situation rights itself in Spain.

Spanish Potash Mines Resume Operations

Great Britain Alarmed at Rise of Imports while Chemical Exports Remain Stationary—Soviet to Start Tung Oil Industry—German Sulfur Cartel Formed—

Spanish potash mines after a period of idleness have resumed operations under the management of control committees set up by workers, according to advices from Paris made public by the Commerce Dept's. Chemical Division. The interruption of operations is reported to have had little effect upon world potash markets as Spanish companies transferred their international cartel quota which is fixed at 14% to producers in other countries.

Greater Increase in Imports

Great Britain's overseas chemical business is failing to keep pace with the general revival in foreign trade. Chemical exports from the United Kingdom to Germany and the U. S. during the first 10 months of the year increased about 8.5 and 4%, respectively, while imports from these countries advanced 17.6 and 13.9%, respectively.

Soviet Sends Tung Oil Commission

The Soviet Union is devoting serious attention to the development of a domestic tung industry and as climatic and soil conditions in its Georgia region are somewhat similar to those found in our Gulf Coast States where some 75,000 acres are now planted to tung trees the Soviet Government is watching development of the American industry with interest. A Soviet Commission is now in the U. S. purchasing seed.

Soviet Plan Urea Plant

Urea is the latest addition to the list of chemical products manufactured in the U.S.S.R., a plant for the manufacture of this material having been started up recently at the Stalinogorsk Chemical Combine. The ammonia-carbon dioxide process, using a pressure of 170 atmospheres and a temperature of 160° C. is being employed. A further plant is under construction at the Tschernoretschje Chemical Works. At this second plant, a process involving the use of liquid ammonia will be employed.

Regulating German Sulfur Sales

The 11 German sulfur producers have formed a cartel to not only handle the output of member concerns but to exercise control over imports and to regulate domestic prices. Output of byproduct sulfur in Germany has increased notably in the last 3 years.

Notes from the Plants

Marvin S. Carr, chemical librarian at du Pont's R. & H. Chemicals Departments' Niagara Falls plant is working out a plan with other companies to make their technical libraries available to students, chemists, and engineers located in the Falls area.

Du Pont has enlarged its technical laboratory by 50% at the dye plant located at Deepwater Point, N. J.

The new year started debtless for 10 employees of the New Castle or tidewater division of American Chemical Paint. Like the other employees of the company at Ambler, Pa., Detroit, and Walkersville, Ont., the New Castle workers will be able to wipe their debt slate clean.

And this because J. Harvey Gravell, president of the company, with offices in Ambler, decided to "be selfish," as he put it, and help his workmen discharge their personal bills.

Permanent exhibition on the third floor of the International Building, Rockefeller Center, N. Y. City, will hereafter be known as the Metals and Plastics Bureau.

Freeport Texas Votes Change of Name

Stock Values Rose 21% in '36—Net Income of 7 Chemical Companies Increased 27% in First 9 Months—Lautaro Nitrate and Anglo-Chilean Nitrate Issue Yearly Statements—New Dow Offering Well Received—

Freeport Texas stockholders have voted to change the name of the company to Freeport Sulphur Co., the name of its principal subsidiary. This subsidiary will shortly be liquidated and on Jan. 1, '37, the present parent company, operating under its new name, became engaged directly in the business of producing and marketing sulfur.

At the meeting, the stockholders voted to reduce the authorized capital stock by 12,699 shares of preferred stock which, under conversion privileges, have been converted into common stock, and to reduce the capital of the company by the sum of $846,600 representing the difference between the par value of the preferred stock converted and the par value of the common stock issued upon conversion.

In commenting on the changes voted by the stockholders, Langbourne M. Williams, Jr., president, said:

"The revision in the corporate structure which involves the liquidation of the present Freeport Sulphur Co. and the change of the holding company to an operating company is in line with current trends toward simplification of corporate structures and will effect tax and other savings.

"The change in the corporate name will make it possible to continue in the trade the name, 'Freeport Sulphur Company,' the country's oldest sulfur producer. This name has acquired standing and reputation in the sulfur industry and is familiar to buyers throughout the world."

In explanation of the reduction of the company's capital, Mr. Williams said, "the preferred stock of the company is convertible into common stock on or before Feb. 1, '45, at the rate of 3⅓ shares of common for each share of preferred converted on or before Feb. 1, '38 and at the rate of 2½ shares of common for each share of preferred converted between Feb. 1, '38 and Feb. 1, '45.

"Pursuant to this conversion privilege, 12,699 shares of preferred stock having an aggregate par value of $1,269,900 have been converted into 42,330 shares of common having an aggregate par value of $423,300. Authorized capital stock has been reduced by 12,699 shares of preferred stock converted, and the capital of the company has been reduced by $846,600, the difference in par value.

"The capital structure of the Freeport Sulphur, after appropriate certificates have been filed in Delaware," Mr. Williams said, "will consist of 12,301 shares of $100 par value 6% cumulative convertible preferred stock and 850,000 shares of $10 par value common stock of which 796,371 shares are now outstanding."

Stock Values Register Gain

For the 4th consecutive year the stock market moved upward in '36 under the stimulus of steadily expanding industrial activity. The gains in leading issues, however, were smaller than in 1935; as measured by the *N. Y. Times* index of 50 stocks the rise amounted to 21% against 33% in the previous year.

In many respects the market of 1936 paralleled that of 1935. The advance in each year was largely of the persistent, "creeping" variety, marked by the absence of the volatile movements that characterized previous cyclical upswings.

In a review of the financial year Sidney Fish, writing in the *N. Y. Times*, reports that for the second consecutive year, trading increased on the Stock Exchange. Sales on the Exchange totaled 496,063,099 shares, against 381,666,197 in '35 and 323,871,840 in '34. It was the largest turnover since '33, when 654,874,210 shares were traded in during the first full year of the current business recovery. The record volume for one year was established in 1929, when sales totaled 1,124,990,980.

Leading chemical stocks, although certainly not deflated on the basis of earnings at the beginning of 1936, have fully kept pace with the general improvement in the quotations for industrial stocks generally, according to a statement issued by Anderson & Cromwell, Inc., Boston, and printed in the *N. Y. Journal of Commerce*. In fact, the appreciation of 9 outstanding chemical equities through mid-December averaged approximately 36%, whereas a gain in the Dow-Jones average of 30 industrial stocks for this period was only 26%.

Net income of the 7 companies in the group that report quarterly increased about 27% for the first 9 months of the year. This figure excludes income received by du Pont from its interest in General Motors. The improvement in earnings has been somewhat less than the gain in market quotations, but the disparity does not seem excessive and is characteristic of periods of increasing business confidence.

Market Slumps in December

The chemical group in common with the general downward trend in the stock market lost ground in the final month of the year. Total value of the chemical stocks listed on the N. Y. Stock Exchange

Dividends and Dates

Name	Div.	Stock Record	Payable
Air Reduction, ext.	25c	Dec. 31	Jan. 15
Air Reduction, q..	25c	Dec. 31	Jan. 15
Allied Chemical, q	$1.50	Jan. 11	Feb. 1
Alum. Co. of Am., 6% pf.	$1.50	Dec. 10	Jan. 1
Am. Smelt & Rfg., q	75c	Jan. 29	Feb. 27
Canadian Induct., pf., q	$1.75	Dec. 15	Jan. 2
Celanese, 7% pr. pf., q	$1.75	Dec. 16	Jan. 1
Certain-Teed Prod., 6% pr. pf.	$1.50	Dec. 18	Jan. 1
Colgate-Palmolive-Peet, pf., q	$1.50	Dec. 5	Jan. 1
Corn Prods. Ref., q	75c	Jan. 4	Jan. 20
Corn Prods. Ref., pf., q	$1.75	Jan. 4	Jan. 15
Devoe & Raynolds, A & B, ext.	25c	Dec. 21	Jan. 1
Devoe & Raynolds, A & B, q	75c	Dec. 21	Jan. 1
Devoe & Raynolds, pf., q	$1.75	Dec. 21	Jan. 1
duPont, deb., q	$1.50	Jan. 8	Jan. 25
Eagle Picher Lead, pf., q	$1.50	Dec. 15	Jan. 2
Eastman Kodak, ext.	25c	Dec. 5	Jan. 2
Eastman Kodak, q	$1.25	Dec. 5	Jan. 2
Eastman Kodak, pf. q	$1.75	Dec. 22	Jan. 2
Freeport Texas, pf., q	$1.50	Jan. 15	Feb. 1
Glidden Co., q	50c	Dec. 17	Jan. 2
Glidden Co., pf., q	56¼c	Dec. 17	Jan. 2
Hercules Powd., pf.	$1.50	Jan. 4	Feb. 15
Industrial Rayon	50c	Dec. 14	Jan. 2
Int. Nat. Nickel, pf. q	$1.75	Jan. 2	Feb. 1
Merck, pf., q	$1.50	Dec. 22	Jan. 2
Monroe Chem., pf., q	87½c	Dec. 14	Jan. 1
Procter & Gamble, 8% pf., q	$2.00	Dec. 24	Jan. 15
Sherwin-Williams, Can., pf., ac.	$1.75	Dec. 15	Jan. 2
Std. Whole. Phos. & Acid, q	30c	Dec. 19	Jan. 2
Tubize-Chatillon, 7% pf., q	$1.75	Dec. 10	Jan. 2
Tubize-Chatillon, 7% pf.	$5.25	Jan. 9	Feb. 1
Union Carbide	80c	Dec. 4	Jan. 1
United Dyewood, pf., q	$1.75	Dec. 11	Jan. 1
United Dyewood, q	25c	Dec. 11	Jan. 2
U. S. Smelt. & Ref.	$2.00	Dec. 31	Jan. 15
Westvaco Chlorine Prod., 5% pf., q	37½c	Jan. 11	Feb. 1
Young, J. S. & Co., q	$1.50	Dec. 18	Jan. 2
Young, J. S. & Co., pf., q	$1.75	Dec. 18	Jan. 2

Price Trend of Chemical Company Stocks

	Nov. 30	Dec. 4	Dec. 11	Dec. 18	Dec. 24	Dec. 31	Net Gain or loss last month	Price on Dec. 31, 1935	1936 High	1936 Low
Air Reduction	82	79¾	78	79½	76	78	— 4	169	86½	58
Allied Chemical	238	230	234½	228	228	226½	—11½	157⅝	245	157
Columbian Carbon	120	119	120½	119¾	...	120	.....	96½	136½	94
Com. Solvents	16½	16	18⅛	18⅛	19⅝	18¾	+ 2¼	21⅝	24⅝	14¼
du Pont	181¼	181	180⅛	179½	174½	173	— 8¼	139½	184¾	133
Hercules Powder	..	137	148	148	146	120¼	.....	87	135	126
Mathieson	41½	40	40⅞	39¼	39	40½	— 1	30¼	42⅜	27½
Monsanto	99½	98	99½	99	98½	98	— 1½	89	103	79
Std. of N. J.	65⅞	64¾	66⅝	66⅝	68⅛	68¾	+ 2⅞	51¾	70⅜	51⅜
Texas Gulf S.	41⅝	40	40¼	39⅜	39⅝	39¼	— ⅞	33¼	44¾	33
Union Carbide	103¼	102⅜	103⅝	102½	102¾	103¾	+ ½	71½	105¼	71⅝
U. S. I.	40	39	40⅝	38⅝	38	38¾	— 1¼	43	59	31¼

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on Jan. 1, 1937, amounted to $6,502,233,633 compared with $6,650,614,575 on Dec. 1, 1936, a net loss for the month of $148,380,942. The average price on Jan. 1, 1937 was $79.60, as compared with $81.42 at the beginning of December, a loss of $1.82.

Earnings of the major industrial chemical companies in the past year reflect the decided improvement in the consumption of chemicals within the industry itself as well as by the so-called process industries which are large consumers of a wide variety of chemicals. In the alcohol group profits were cut by severe outbursts of price competition and the same thing is true of the fertilizer group. Below is given an analysis of the latest earnings statements of a representative list of industrial chemical producers.

Lautaro Nitrate Annual Report

Lautaro Nitrate's report shows that for the fiscal year to June 30th earnings fell about £271,000 short of meeting the fixed charges on the company's debt.

G. B. Whelpley, president, explains, however, that under the plan of readjusting the company's debt, which is to be converted into income obligations, there will be available for distribution from earnings a total of £321,932, of which £80,433 will be paid against the indebtedness and the remaining £241,449 distributed in the form of interest at the rate of about 3%.

Anglo-Chilean Earns £363,289

Anglo-Chilean Nitrate reports for itself and its subsidiary for the year to June 30th a profit of £363,289. This is to be distributed in accordance with the trust deed, as amended, for the 4½% (income) 1st-mortgage debenture stock and the indenture securing the sinking-fund income debentures as follows:

Interest on 4½% (income) 1st-mortgage debenture stock paid on July 1, '36, and payable on Jan. 1, '37, £118,569; amount applicable to amortization of 1st-mortgage debenture stock, £128,477; balance available for service of sinking-fund income debentures, £116,243, of which £92,985 was applicable to interest payable on Jan. 1, '37, and £23,258 was applicable to amortization. Report gives effect to the readjustment plan of the company dated Jan. 27, '36, which was approved by the Chilean court on July 13, '36.

Montecatini's Dollar Bonds

Arrangements have been completed for the payment in N. Y. City of the last instalment, amounting to $5,000,000, for the redemption of Montecatini's 7% Sinking Fund debenture dollar bonds. These bonds, which were issued in N. Y. City during 1927, were due to mature on Jan. 1, 1937. Repayment is being made in accordance with the original issue terms which provided for redemption at par The service of this Italian company's debt was fully maintained during the sanctions period. Both interest and sinking funds were fully honored. Of the $10,000,000 Montecatini bonds authorized, $8,750,000 were issued in N. Y. City at 96½. The remaining $1,250,000 were offered in England, Sweden, Germany, Holland and Switzerland.

Dow Floats New Issue

A new issue of $5,000,000 Dow Chemical Co. 15-year 3% debentures was offered on Dec. 15th, at par. The offering was reported as being well received. It is expected that proceeds of the issue will be used to supply funds for, or to replenish working capital applied during the year ended Oct. 31, '36, to capital additions, replacements and improvements to plants, processes and facilities, and the purchase of stock of a subsidiary, Cliffs Dow Chemical. Balance of the proceeds will be expended on projects to be selected in the light of future business conditions, trade developments and the results of experimental work.

Ohio Chemical Increases Capital

Ohio Chemical's plans for increasing the capital from 100,000 to 300,000 shares of no-par common were approved by stockholders at special meeting last month while directors at a subsequent meeting voted a 200% stock dividend, giving holders 2 additional shares for each one held.

Tenn. Products Reorganizes

Reorganization of the bankrupt Tennessee Products Corp., one of the largest coke, charcoal and chemical manufacturing concerns in the South, has been completed and accepted by substantially more than the required number of creditors and stockholders, it was announced recently from the office of President Frederic Leake.

Calls Entire Bond Issue

Buffalo Electro-Chemical, called its entire issue of first 7% bonds, amounting to $160,000, for payment Jan. 1st, '37, at the Marine Trust Co., Buffalo, at 103 and interest. Bonds were due Jan. 1, '41.

Dividend News

American Hard Rubber resumed dividends on the common stock with a declaration of $1 a share on the common, payable on Dec. 24th. The last previous payment was 50c made in May of '31.

Directors of Hilton-Davis Chemical announced last month an initial dividend of 25c a share on the common and the first quarterly dividend of 37½c on the preferred.

Great Western Electro-Chemical voted last month a dividend of $1.60 a share on the common payable on Dec. 24th. This compares with 80c a share paid previously.

Climax Molybdenum voted last month a special dividend of 20c a share on the common.

Devoe & Raynolds last month declared an extra dividend of 25c and quarterly of 75c on the Class A and B common stocks. The quarterly dividend places the issue on $3 annual basis against $2 previously.

Eagle-Picher Lead voted a dividend of 40c a share. This payment will bring total dividends for the year to 60c a share. Last year no dividends were paid.

An exhibition of alloy steels—the "new steels of today and tomorrow"—is now being held at Metal Products Exhibits, permanent exhibition of metals, alloys, plastics, and finishes in the International Bldg., Rockefeller Center, N. Y. City. Display, which was arranged under the direction of Adolf Bregman, Managing Editor of *Metal Industry*, includes products of 21 American manufacturers of steels and alloys. Exhibit is open daily from 10 A. M. to 6 P. M. and is free to the public.

Net Earnings Rose Sharply in 1936

Company:	Period	Net Profit 1936	Net Profit 1935	Common Share Earnings	
Air Reduction Co.	9 mos. Sept. 30	$5,272,461	$3,895,787	$2.08	$1.55
Atlantic Refining Co.	9 mos. Sept. 30	6,161,200	1,880,500	2.20	.71
Atlas Powder Co.	12 mos. Sept. 30	1,455,049	1,018,965	4.24	2.16
American Cyanamid Co.	9 mos. Sept. 30	2,803,266	2,533,969	1.11	1.00
Columbian Carbon Co.	9 mos. Sept. 30	2,654,104	2,127,787	4.94	3.95
Commercial Solvents	9 mos. Sept. 30	*1,667,400	*1,604,522	.63	.61
Du Pont Co.	9 mos. Sept. 30	62,567,019	40,154,667	5.31	3.22
Freeport Texas Co.	9 mos. Sept. 30	1,510,510	889,641	1.82	1.05
Glidden	11 mos. Sept. 30	2,203,989	2,019,659	*h*2.23	*h*2.13
Hercules Powder	9 mos. Sept. 30	2,931,449	2,248,490	4.23	2.90
Industrial Rayon Corp.	9 mos. Sept. 30	923,557	415,919	1.52	.69
International Nickel	9 mos. Sept. 30	27,029,080	18,080,827	1.75	1.14
Johns-Manville	9 mos. Sept. 30	3,093,560	1,573,040	3.60	1.57
Mathieson Alkali	9 mos. Sept. 30	1,202,372	978,892	1.30	1.03
Monsanto	9 mos. Sept. 30	3,290,721	2,808,687	*h*2.89	*h*2.76
Penick & Ford	9 mos. Sept. 30	982,486	667,776	2.66	1.80
Texas Gulf Sulphur	9 mos. Sept. 30	*7,723,391	*5,265,209	2.01	1.37
Union Carbide & Carbon	12 mos. Sept. 30	34,024,317	23,588,724	3.78	2.62
United Carbon	9 mos. Sept. 30	1,574,965	1,363,721	3.96	3.43

* Taken from quarterly reports; *h* On shares outstanding at the close of the respective periods.

Chemical Stocks and Bonds

1936 December Last	1936 December High	1936 December Low	1935 High	1935 Low	1934 High	1934 Low	Sales	Stocks	Par $	Shares Listed	Dividends*	Earnings $-per share-$ 1935	Earnings $-per share-$ 1934
							Number of shares Dec. 1936	1936					
NEW YORK STOCK EXCHANGE													
78	86¼	58	57½	35	37⅝	30⅝	19,000	307,700	Air Reduction	No	2,523,864	$2.50	2.10	1.66
226½	245	157	173	125	160¾	115⅛	11,000	259,500	Allied Chem. & Dye	No	2,214,099	6.00	8.71	6.83
84½	89	49	57¾	41½	48	25¼	5,500	125,800	Amer. Agric. Chem.	100	315,701	2.25	p4.71	p6.37
27	35⅜	20½	35¾	22½	62½	20¾	79,800	480,800	Amer. Com. Alcohol	20	260,716	.50	3.16	3.57
42⅝	50	37	52	36	39⅛	26¼	8,700	87,400	Archer-Dan-Midland	No	549,546	3.00	p3.05	p4.21
74	84	48	48½	32¾	55½	35¼	1,000	59,900	Atlas Powder Co.	No	234,235	3.50	2.81	2.49
130	131	112	115	106¾	106¾	83	490	6,500	5% conv. cum. pfd.	100	88,781	5.00	16.93	13.54
27	32¼	21¾	35⅜	19½	44⅞	17⅛	224,900	1,246,500	Celanese Corp. Amer.	No	987,800	1.50	1.99	1.25
108	116	106	111¼	97½	102	83	1,425	12,575	prior pfd.	100	263,668	7.00	.....	.....
21	21¼	13	21	15⅛	18⅛	9⅜	116,900	997,500	Colgate-Palm.-Peet	No	1,985,812	.75	1.36	1.16
103¼	106½	100	107¼	101	102½	68½	8,000	21,400	6% pfd.	100	254,500	6.00	16.79	16.14
120	136½	94	101¼	67	77¼	58	9,300	162,700	Columbian Carbon	No	538,154	5.75	5.56	3.93
18¾	24⅜	14¼	23⅞	16½	36¾	15¾	520,200	2,518,700	Commer. Solvents	No	2,635,371	.80	1.02	.89
68⅛	82½	63⅜	78⅜	60	84½	55½	33,500	560,500	Corn Products	25	2,530,000	3.75	2.62	3.16
170	170	158	165	148¼	150½	135	1,500	12,880	7% cum. pfd.	100	243,739	7.00	33.97	39.65
61½	63	42	50⅜	35½	55¼	29	3,400	58,100	Devoe & Rayn. A	No	95,000	2.00	2.89	2.36
173	184¾	133	146½	86⅝	103⅞	80	47,300	520,300	DuPont de Nemours	20	10,871,997	6.10	5.04	3.63
135	136½	129	132	126⅞	128½	115	3,300	40,800	6% cum. deb.	100	1,092,699	6.00	56.94	42.73
175	185	156	172¼	110½	116½	79	9,500	123,200	Eastman Kodak	No	2,250,921	6.75	6.90	6.28
162	166	152	164	141	147	120	340	4,070	6% cum. pfd.	100	61,657	6.00	258.09	235.22
27¼	35⅝	23½	30⅝	17¼	50⅜	21½	50,100	435,300	Freeport Texas	10	784,664	1.00	1.78	1.76
112	135	108	125	112½	160⅛	113½	390	2,120	6% conv. pfd.	100	25,000	6.00	121.30	120.08
45¼	55¼	39½	49½	23⅜	28⅜	15⅝	48,300	394,300	Glidden Co.	No	603,304	2.00	.....	x 2.91
56	56	52¼					5,100	77,900	4½% cum. pfd.	50	200,000	2.25	.....	.....
101	133	99⅝	119½	85	96⅞	74	2,800	29,000	Hazel Atlas	25	434,409	7.64	7.58	5.21
146	146	84	90	71	81⅝	59	2,700	41,700	Hercules Powder	No	582,679	5.44	4.23	3.94
130	135	126	131	122	125¾	111	1,260	5,250	7% cum. pfd.	100	105,765	6.00	36.30	28.79
38	41⅜	25⅝	36⅜	23½	32	19¾	31,200	479,700	Industrial Rayon	No	600,000	2.10	1.00	2.23
5	5⅞	2⅞	5	2⅝	6⅛	2	49,900	378,500	Intern. Agricul.	No	436,049	None	p1.55	p—.99
43¼	47¼	22¾	42¾	26	37¼	15	28,300	106,500	7% cum. pr. pfd.	100	100,000	None	p2.23	p2.69
63⅝	66⅜	43¼	47¼	22¼	29¼	21	274,400	2,554,400	Intern. Nickel	No	14,584,025	1.30	1.65	1.14
26⅞	30	23	36¼	25	32	21	2,300	39,400	Intern. Salt	No	240,000	2.00	1.32	2.02
35½	36¾	29¾	36¼	31	33⅛	15¾	11,900	43,900	Kellogg (Spencer)	No	500,000	1.60	.....	v2.22
70¾	80¼	47¼	49¼	21½	43⅞	22½	96,300	764,800	Libbey Owens Ford	No	2,559,042	3.50	3.26	1.25
45	46½	32½	37¼	24½	35⅜	16⅛	27,900	229,600	Liquid Carbonic	No	342,406	1.60	v3.06	1.96
40½	42⅜	27½	33⅞	23¾	40¾	23½	20,200	344,400	Mathieson Alkali	No	650,436	1.50	1.44	1.20
98½	103	79	94¾	55	61⅝	39	16,300	178,100	Monsanto Chem.	10	864,000	3.00	3.84	3.03
34⅛	36½	26⅜	20⅝	14½	17	13½	62,000	365,400	National Lead	10	3,098,310	.875	1.08	.84
171	171	155	162½	150	146½	122	400	3,500	7% cum. "A" pfd.	100	243,676	7.00	25.40	20.12
143¼	147	137¾	140½	121⅝	121½	100½	50	3,430	6% cum. "B" pfd.	100	103,277	6.00	49.05	35.36
36⅜	40	9	10⅞	4⅜	13	5½	412,600	1,636,600	Newport Industries	1	519,347	.60	.57	.31
154	164	125	129	80	94	60	8,300	143,900	Owens-Illinois Glass	25	1,200,000	6.00	6.52	5.41
56	56	40¼	53¾	42⅜	44⅜	33⅛	35,100	331,700	Procter & Gamble	No	6,410,000	1.87	p2.39	p2.23
118	122½	115¾	121	115	117	102½	360	4,700	5% pfd. (ser. 2-1-29)	100	171,569	5.00	p94.14	p88.13
12¼	13	5⅝	8¾	4	6¾	3⅛	276,100	888,000	Tenn. Corp.	5	857,896	.15	.22	.27
39¼	44¾	33	36¾	28¾	43¼	30	35,300	674,900	Texas Gulf Sulphur	No	2,540,000	2.50	1.94	1.81
103¾	105¼	71⅝	75¾	44	50⅞	35⅞	71,800	896,000	Union Carbide & Carbon	No	9,000,743	2.30	3.06	2.28
85¼	96¾	68	78	46	50⅜	35	13,400	217,800	United Carbon	No	370,127	4.05	4.71	3.55
38¾	59	31¼	50⅝	35⅝	64¾	32	62,100	884,600	U. S. Indus. Alco.	No	391,033	1.00	2.16	4.04
29⅜	30½	16¼	21¾	11¼	31¾	14	156,100	711,200	Vanadium Corp.-Amer.	No	366,637	None	—1.13	—2.29
7⅝	8½	4⅛	4⅝	2½	5⅜	1⅞	145,300	620,300	Virginia-Caro. Chem.	No	486,000	None	p2.56	p—.79
55½	58¾	28¾	35¾	17½	26	10	92,100	457,600	6% cum. part. pfd.	100	213,392	None	p.16	p4.20
23½	32	19¾	25½	16¾	27¼	14⅞	14,300	154,200	Westvaco Chlorine	No	284,962	.75	1.63	1.55
33½	35¼	31¾					6,500	36,900	Westvaco Chlorine, cum. pfd.	30	192,000	1.50	.....	.....
NEW YORK CURB EXCHANGE														
36	40¼	29¼	30	15	22½	14⅝	39,800	623,500	Amer. Cyanamid "B"	No	2,404,194	1.00	1.61	.99
2⅛	3¼	2⅛	4	2	4⅛	2⅜	2,500	13,500	British Celanese Am. R.	10	2,806,000	None	—.71%	—.58%
107	116¼	99¼	115	90	105¼	81	3,100	17,125	Celanese, 7% cum. 1st pfd.	100	144,379	7.00	21.96	16.37
10½	16½	9	15	7	19	7	1,350	11,250	Celluloid Corp.	15	194,952	None	—.95	—1.67
14	15	11⅞	14½	11⅝	14⅜	10½	1,000	6,900	Courtaulds' Ltd.	1 £	24,000,000	7½%	7.51%	7.57%
135	142¼	94⅜	105½	80½	91	67½	13,130	79,930	Dow Chemical	No	945,000	2.40	4.42	3.32
6¾	10¾	5	12½	6¼	10¾	4	10,200	129,000	Duval Texas Sulphur	No	500,000	.50	.16	x .25
40	55	39	58	37	40¾	19	2,350	10,450	Heyden Chem. Corp.	10	147,600	2.25	3.22	3.07
125½	140	98¼	97¼	46¾	57½	39	6,160	78,000	Pittsburgh Plate Glass	25	2,141,305	6.00	5.32	2.69
139½	154½	117	128⅞	84	90½	47¼	5,350	140,860	Sherwin Williams	25	635,583	4.00	.....	y6.19
112	116	110	113½	106	109¾	100	400	5,460	5% pfd. cum.	100	155,521	5.00	.....	y33.17
PHILADELPHIA STOCK EXCHANGE														
159	179	114¼	116¾	76½	75	50¼	1,050	5,025	Pennsylvania Salt	50	150,000	8.50	v8.57	v5.94

1936 December Last	1936 December High	1936 December Low	1935 High	1935 Low	1934 High	1934 Low	Sales	Bonds	Date Due	Int. %	Int. Period	Outstanding $
NEW YORK STOCK EXCHANGE							Dec. 1936	1936				
109	117½	107¾	116	104½	106¾	83⅞	856,000	4,951,000	Amer. I. G. Chem. Conv. 5½'s	1949	5½ M. N.	29,929,000
36½	42½	27½	29¾	7⅜	17¾	5	254,000	2,514,000	Anglo Chilean Nitrate inc. deb.	1967	4½-5	12,433,000
101¾	102¾	92½	94½	77¾	88	61½	29,000	1,042,000	By-Products Coke Corp. 1st 5½'s "A"	1945	5½ M. N.	4,932,000
101	102¾	96¾	100¼	91⅜	92	62	13,000	1,045,000	Int. Agric. Corp. 1st Coll. tr. stpd. to 1942	1942	5 M. N.	5,994,100
38¼	39	21	21½	7	19½	5⅛	691,000	12,009,000	Lautaro Nitrate conv. b's	1954	6 J. J.	31,357,000
99¾	99¾	66½	94	65	98½	89⅞	54,000	754,000	Montecatini Min. & Agric. deb. 7's with war.	1937	7 J. J.	7,075,045
23½	35	23½	38	32⅛	74½	34½	2,000	55,000	Ruhr Chem. 6's	1948	6 A. O.	3,156,000
104¾	105	103	104	91½	90	65½	17,000	478,000	Tenn. Corp. deb. 6's "B"	1944	6 M. S.	3,007,900
98½	98½	85¾	94¼	66	89½	62	603,000	1,817,000	Vanadium Corp. conv. 5's	1941	5 A. A.	4,261,000

† Year ended 5-31-35; p Year ended 6-30-35; v Years ended 6-1-35 and 6-1-36; y Year ended 8-31-35; z Year ended 8-31-35; * Paid in 1936, including extras; x Year ended 10-31-35.

Industrial Trends

1936—A Year of Wide Gains in Business Activity Led by the Steel and Automotive Industries—Favorable Outlook for First Quarter Darkened by Labor Troubles—Chemical Sales Up 15% in '36—

Business activity in this country closed out the year 1936 at a pace much swifter than even the most optimistic prognosticators dared hope for 12 months previously. A preliminary compilation by the Federal Reserve Bank of N. Y. shows that the volume of production and trade in the past year was approximately 15% above the 1935 total, and 45% above the 1932 level.

The steady gains in recovery in '36 were particularly pronounced in the steel and automotive fields. Production of steel ingots advanced 43% over the previous year; automobile production was 11% over 1935, and 220% over the low-point of '32. Other chemical consuming industries have shown remarkable recoveries in the past 12 months. The paper trade with an estimated 12,000,000-ton production bettered the high mark reached in '29. The paint industry enjoyed its best year since the boom period. Construction, while still only 45% of the '29 volume, made rapid strides, particularly so in the private building and residential fields. Consumption of rubber in the past 12 months exceeded all previous records and shoe and rayon production did likewise.

Christmas buying increased 10% over '35 and was the best year the retail merchants have experienced since 1930. Wholesalers in many lines reported great difficulty in filling last minute demands. Generally speaking, both retailers and wholesalers cleared their stocks nicely leaving no unwieldy surpluses to plague them in the first quarter of the new year.

Carloadings reflected the improved state of business. The net gain for the year was 20½% over 1935 and the total was the highest since 1931. Year-end rail earnings are reported to be at the highest point since 1929. Production of electricity week by week last month showed gains of approximately 12 to 14% over the corresponding period in '35. The *N. Y. Times* Index of Business Activity while registering a slight decline in the final week of the month gained sharply over the November level. Wholesale commodity prices continued to advance strongly throughout the month. Certain of the advances were quite sensational, as for example, the rises recorded in lead and naval stores.

The one discordant note in the recovery song is the labor situation. The flat glass industry has been tied-up with sit-down strikes now for several weeks and as this is written labor leader Lewis is making threatening gestures at all of the General Motors plants. The shipping strike continues and shortages of certain materials are becoming quite evident.

However, despite the uncertainty over labor conditions, a high feeling of optimism prevails generally, specially in the steel industry. The backlog position of the steel companies at the close of the year is the strongest since the boom years. Without much additional business the steel mills will be able to operate at 80% for most of the first quarter. Because of the menace of strikes in the Detroit area it is impossible to estimate with any certainty automotive output in the first three months of '37. Cleared of strikes it should equal the '29 level.

Chemical Sales Up 15%

Chemical producers are satisfied over the tonnages moved in '36. Several of the larger concerns estimate the sales improvement over '35 at 12 to 15%. The volume of chlorine, soda ash, and caustic moved was especially heavy. The industry generally has passed through a very successful contract season and is looking forward to even greater tonnages during the current year. It is hardly likely, however, that the same percentage of improvement will be reached in '37 that was made in '36. Nevertheless producers are anticipating further healthy increases in nearly all items.

January is usually a poor month for chemical shipments, but all indications point to a volume in the first month of the year at least equal to and probably better than that reported for January, '36.

The Ohio State University Research Foundation has been formed for the purpose of obtaining closer relationship with industries, specially those of Ohio, in solving their research problems. Among the incorporators are Charles F. Kettering, president, G. M. Research Corp., and Charles E. MacQuigg, metallurgical engineer and manager of Carbides' research laboratories at Long Island City, N. Y.

World production of chrome ore last year, exclusive of the output of the U. S. S. R., is estimated at 430,000 tons, a distinct rise on the 375,000 tons of '33 and the 235,000 tons of '32.

Statistics of Business

	November 1936	November 1935	October 1936	October 1935	September 1936	September 1935
Automotive Production	394,890	395,059	224,628	272,043	135,130	87,540
Bldg. Contracts*‡	$208,204	$188,115	$225,839	$200,595	$234,270	$167,376
Failures, Dun & Bradstreet	688	898	611	1,056	586	787
Merchandise imports‡	$196,423	$169,385	$215,525	$161,647	$215,525	$161,647
Merchandise exports‡	$225,766	$269,838	$219,967	$198,803	$219,967	$198,803
Newsprint Production						
Canada, tons	285,771	262,854	301,106	266,515	269,782	223,892
U. S., tons	79,853	78,929	81,027	79,746	72,216	71,416
Newfoundland, tons	28,201	28,567	30,677	29,744	28,329	27,161
Plate Glass prod., sq. ft.	13,083,963	15,909,262	20,752,657	16,592,803	19,552,775	14,404,060
Steel ingots production, tons	4,337,000	3,150,000	4,545,001	3,142,759	4,161,000	2,825,000
Steel activity, % capacity	.....	.....	.....	.....	.....	.....
Pig iron production, tons	2,947,000	2,065,000	2,991,887	1,978,411	2,992,968	1,978,411
U. S. consumption, crude rubber, tons	50,303	42,310	49,509	41,969	46,330	37,086
Tire shipments	.....	.....	4,081,023	4,054,147	3,835,998	3,303,333
Tire production	.....	.....	5,123,467	4,050,509	4,981,131	3,786,873
Tire inventory	.....	.....	10,088,510	8,290,594	9,005,065	8,287,825
Dept. of Labor Indices†						
Factory payrolls, totals†	90.1	75.5	88.8	76.3	83.4	73.5
Factory employment†	96.6	88.7	96.5	89.3	95.3	88.0
Chemical employment†a	119.2	113.8	120.2	115.5	119.5	108.0
Chemical payrolls†a	112.9	100.4	113.9	103.0	112.0	98.8
Chemicals and Related Products						
Exports‡	.....	$10,463	$10,831	$3,959	$9,642	$9,016
Imports‡	.....	$6,685	$7,719	$5,010	$5,840	$4,618
Stocks, mfg. goods	.....	.....	121	117	130	120
Stocks, raw materials	.....	.....	107	115	96	98
Boot and shoe production	.....	.....	39,361,698	35,947,810	40,097,430	33,909,182

Week Ending	Carloadings 1936	Carloadings 1935	Carloadings % of Change	Electrical Output§ 1936	Electrical Output§ 1935	Electrical Output§ % of Change	Jour. of Com. Price Index	National Fertilizer Association Indices Chem. & Drugs	Fats & Oils	Fert. Mat.	Mixed Fert.	‡‡Labor Dept. All Groups	Chem. & Drug Price Index	% Steel Activity	N. Y. Times Index Bus. Act.	Fisher's Index Pur. Power
Nov. 28	679,984	571,878	+18.9	2,133,511	1,876,684	+13.7	83.3	96.5	82.2	68.5	74.7	81.2	82.7	75.9	106.8	116.2
Dec. 5	744,957	638,518	+16.7	2,243,916	1,969,662	+13.9	84.0	96.5	85.4	69.1	74.7	81.8	83.3	76.6	106.2	115.3
Dec. 12	738,957	616,650	+19.8	2,278,303	1,983,431	+14.9	84.9	96.5	89.3	69.2	74.7	82.3	84.2	79.2	108.6	115.5
Dec. 19	729,696	600,666	+21.5	2,274,508	2,002,005	+13.6	85.5	96.3	90.4	69.2	75.9	82.8	85.4	77.0	110.0	114.5
Dec. 26	562,218	466,688	+20.5	2,080,954	1,847,264	+12.7	86.2	93.6	90.6	69.5	75.9	83.1	86.1	77.0	109.6	113.8
Jan. 2	.....	.....	.....	.....	.....	.....	86.7	....	....	....	....	....	....	....	....	112.7

* 37 states; † Dept. of Labor, 3 year average, 1923-1925 = 100.0; ‡ 000 omitted; § K.W.H., 000 omitted; *a* Includes all allied products but not petroleum refining; ‡‡ 1926-1928 = 100.0; *y* Preliminary; *z* Revised.

Prices Current

Heavy Chemicals, Coal-tar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Petroleum Solvents and Chemicals, Naval Stores, Fats and Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Import chemicals are so designated. Resale stocks when a market factor are quoted in addition to maker's prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f. o. b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f. o. b., or ex-dock. Materials sold f. o. b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1935 Average $1.21 - Jan. 1936 $1.19 - Dec. 1936 $1.14

		Current Market	1936 Low	1936 High	1935 Low	1935 High
Acetaldehyde, drs, c-l, wgs	lb.	...	.14	...	.14	...	.14
Acetaldol, 95%, 50 gal drs wks	lb.	.21	.25	.21	.25	.21	.25
Acetamide, tech, lcl, kegs	lb.	.38	.43	.38	.43	.38	.43
Acetanalid, tech, 150 lb bbls	lb.	.24	.26	.24	.26	.24	.26
Acetic Anhydride, 100 lb cbys drs, f.o.b. wks, frt allowed	lb.	.21	.25	.21	.25	.21	.25
Acetin, tech, drs	lb.	...	.15	...	...	...	...
Acetone, tks, f.o.b. wks, frt allowed	lb.	.22	.24	.22	.24	.22	.24
drs, c-l, f.o.b. wks, frt allowed	lb.	...	.06	.06	.12	.11	.12
Acetyl chloride, 100 lb cbys	lb.	.55	.68	.55	.68	.55	.68
ACIDS							
Abietic, kgs, bbls	lb.	.06¾	.07	.06¾	.07	.06¾	.07
Acetic, 28%, 400 lb bbls, c-l, wks	100 lbs.	...	2.45	...	2.45	2.40	2.45
glacial, bbls, c-l, wks	100 lbs.	...	8.43	...	8.43	8.25	8.43
glacial, USP, bbls, c-l, wks	100 lbs.	...	12.43	...	12.43	12.25	12.43
Adipic, kgs, bbls	lb.	...	.72	...	.72	...	.72
Anthranilic, refd, bbls	lb.	.85	.95	.85	.95	.85	.95
tech, bbls	lb.	...	.75	...	.75	...	.75
Battery, cbys, delv	100 lbs.	1.35	2.50	1.35	2.50	1.60	2.25
Benzoic, tech, 100 lb kgs	lb.	.40	.45	.40	.45	.40	.45
USP, 100 lb kgs	lb.	.54	.59	.54	.59	.54	.59
Boric, tech, gran, 80 tons, bgs, delv	ton *a*	...	95.00	...	95.00	80.00	95.00
Broenner's, bbls	lb.	...	1.11	1.11	1.25	1.20	1.25
Butyric, 95%, cbys	lb.	.53	.60	.53	.60	.53	.60
edible, c-l, wks, cbys	lb.	1.20	1.30	1.20	1.30	1.20	1.30
synthetic, c-l, drs	lb.	...	.22	...	.22	...	.22
wks	lb.	...	.23	...	.23	...	.23
tks, wks	lb.	...	.21	...	.21	...	.21
Camphoric, drs	lb.	...	5.25	...	5.25	...	5.25
Chicago, bbls	lb.	...	2.10	...	2.10	...	2.10
Chlorosulfonic, 1500 lb drs, wks	lb.	.03½	.05	.03½	.05	.03½	.05½
Chromic, 99¾%, drs, delv	lb.	.14¾	.16¾	.14¾	.16¾	.13¾	.16¾
Citric, USP, crys, 230 lb bbls	lb. *b*	.25	.26	.25	.29	.28	.29
anhyd, gran, bbls	lb. *b*	...	.29	.29	.31	...	.31
Cleve's, 250 lb bbls	lb.	.50	.52	.50	.54	.52	.54
Cresylic, 99%, straw, HB, drs, wks, frt equal	gal.	.72	.74	.51	.74	.46	.53
99%, straw, LB, drs, wks, frt equal	gal.	.77	.79	.68	.79	.64	.68
resin grade, drs, wks, frt, equal	lb.	.09	.09½	.52*y*	.65*y*	.52*y*	.55*y*
Crotonic, drs	lb.	.90	1.00	.90	1.00	.90	1.00
Formic, tech, 140 lb drs	lb.	.11	.13	.11	.13	.11	.13
Fumaric, bbls	lb.	...	.60	...	.60	...	.60
Fuming, see Sulfuric (Oleum)							
Fuoric, tech, 90%, 100 lb. drs	lb.	...	.35	...	.35	...	.35
Gallic, tech, bbls	lb.	.65	.68	.65	.68	.65	.68
USP, bbls	lb.	.70	.80	.70	.80	.70	.80
Gamma, 225 lb bbls, wks	lb.	...	.85	.80	.85	.77	.79
H, 225 lb. bbls, wks	lb.	.50	.55	.50	.55	.50	.55
Hydriodic, USP, 10% sol. cbys	lb.	.50	.51	.50	.51	.50	.51
Hydrobromic, 48% com 155 lb cbys, wks	lb.	.45	.48	.45	.48	.45	.48
Hydrochloric, see muriatic.							
Hydrocyanic, cyl, wks	lb.	.80	1.30	.80	1.30	.80	1.30
Hydrofluoric, 30%, 400 lb bbls, wks	lb.	.07	.07½	.07	.07½	.07	.07½
Hydrofluosilicic, 35%, 400 bbls, wks	lb.	.11	.12	.11	.12	.11	.12
Lactic, 22%, dark, 500 lb bbls	lb.	.02½	.02¾	.02½	.05	.04½	.05
22%, light refd, bbls	lb.	.03½	.03¾	.03½	.07	.06½	.07
44%, light, 500 lb bbls	lb.	.05½	.05¾	.05½	.12	.11½	.12
44%, dark, 500 lb bbls	lb.	.06½	.06¾	.06½	.10	.09½	.10
50%, water white, 500 lb bbls	lb.	.10½	.11½	.10½	.14½	...	...
USP X, 85%, cbys	lb.	.45	.50	.45	.50	.45	.50
Laurent's, 250 lb bbls	lb.	.45	.46	.45	.47	.36	.37
Linoleic, bbls	lb.	.16	.16	.16	.16	.16	.16
Maleic, powd, kgs	lb.	.29	.32	.29	.32	.29	.32
Malic, powd, kgs	lb.	.45	.60	.45	.60	.45	.60
Metanillic, 250 lb bbls	lb.	.60	.65	.60	.65	.60	.65
Mixed, tks, wks	N unit	.06½	.07¼	.06½	.07¼	.06½	.07¼
	S unit	.008	.009	.008	.009	.008	.009
Monochloracetic, tech, bbls	lb.	.16	.18	.16	.18	.16	.18
Monosulfonic, bbls	lb.	1.50	1.60	1.50	1.60	1.50	1.60
Muriatic, 18°, 120 lb cbys, c-l, wks	100 lb.	...	1.35	...	1.35	...	1.35
tks, wks	100 lb.	...	1.00	...	1.00	...	1.00
20°, cbys, c-l, wks	100 lb.	...	1.45		1.45	...	1.45
tks, wks	100 lb.	...	1.10	1.10	1.20	...	1.20
22°, c-l, cbys, wks	100 lb.	...	1.95	...	1.95	...	1.95
tks, wks	100 lb.	...	1.60	...	1.60	...	1.60
CP, cbys	lb.	.06½	.07½	.06½	.07½	.06½	.07½
N & W, 250 lb bbls	lb.	.85	.87	.85	.87	.85	.87
Naphthenic, 240-280 s.v., drs	lb.	.11	.14	.11	.14	.11	.14
Sludges, drs	lb.	.06	.10	.06	.10	...	...
Naphthionic, tech, 250 lb bbls	lb.	.60	.65	.60	.65	.60	.65
Nitric, 36°, 135 lb cbys, c-l, wks	100 lb. *c*	...	5.00	...	5.00	...	5.00
38°, c-l, cbys, wks	100 lb. *c*	...	5.50	...	5.50	...	5.50
40°, cbys, c-l, wks	100 lb. *c*	...	6.00	...	6.00	...	6.00
42°, c-l, cbys, wks	100 lb. *c*	...	6.50	...	6.50	...	6.50
CP, cbys, delv	lb.	.11½	.12½	.11½	.12½	.11½	.12½
Oxalic, 300 lb bbls, wks, or N. Y.	lb.	.11½	.12½	.11½	.12½	.11½	.12½
Phosphoric, 50%, USP, cbys	lb.	.14	.14	.14	.14	.14	.14
50%, acid, c-l, drs, wks	lb.	.06	.08	.06	.08	.06	.08
75%, acid, c-l, drs, wks	lb.	.09	.10½	.09	.10½	.09	.10½
Picramic, 300 lb bbls, wks	lb.	.65	.70	.65	.70	.65	.70
Picric, kgs, wks	lb.	.30	.40	.30	.40	.30	.40
Propionic, 98% wks, drs	lb.	...	.35	...	.35	...	.35
80%	lb.	.15	.17½	.15	.17½	.15	.17½
Pyrogallic, crys, kgs, wks	lb.	1.55	1.65	1.55	1.65	1.55	1.65
Salicylic, tech, 125 lb bbls, wks	lb.	...	.40	...	.40	...	.40
Sebacic, tech, drs, wks	lb.	...	.58	...	.58	...	.58
Succinic, bbls	lb.	...	.75	...	.75	...	.75
Sulfanilic, 250 lb bbls, wks	lb.	.17	.18	.17	.19	.18	.19
Sulfuric, 60°, tks, wks	ton	...	12.00	11.00	12.00	...	11.00
c-l, cbys, wks	100 lb.	...	1.10	...	1.10	...	1.10
66°, tks, wks	ton	...	15.50	...	15.50	...	15.50
c-l, cbys, wks	100 lb.	...	1.35	...	1.35	...	1.35
CP, cbys, wks	lb.	.06½	.07½	.06½	.07½	.06½	.07½
Fuming (Oleum) 20% tks, wks	ton	...	18.50	...	18.50	...	18.50
Tannic, tech, 300 lb bbls	lb.	.19	.36	.19	.40	.23	.40
Tartaric, USP, gran powd, 300 lb bbls	lb.	...	.22¾	.22¾	.24	.24	.25
Tobias, 250 lb bbls	lb.	.65	.67	.65	.72½	.70	.80
Trichloroacetic bottles	lb.	2.45	2.75	2.45	2.75	2.45	2.75
kgs	lb.	...	1.75	...	1.75	...	1.75
Tungstic, tech, bbls	lb.	1.50	1.60	1.50	1.60	1.50	1.60
Vanadic, drs, wks	lb.	1.10	1.20	1.10	1.20	1.10	1.20
Albumen, light flake, 225 lb bbls	lb.	.50	.60	.50	.60	.45	.60
dark, bbls	lb.	.12	.17	.12	.17	.12	.17
egg, edible	lb.	.77	.79	.77	1.05	.85	1.05
vegetable, edible	lb.	.65	.70	.65	.70	.65	.70
ALCOHOLS							
Alcohol, Amyl (from Pentane) tks, delv	lb.	...	.123	.123	.143	...	...
c-l, drs, delv	lb.	...	.133	.133	.150	...	...
lcl, drs, delv	lb.	...	.143	.143	.157	...	...
Amyl, secondary, tks, delv	lb.	...	.08½	.08½	.108	...	.108
Benzyl, bottles	lb.	.65	1.10	.65	1.10	.65	1.10
Butyl, normal, tks, f.o.b. wks, frt allowed	lb. *d*	...	.08½	.08½	.11	.11	.12
c-l, drs, f.o.b. wks, frt allowed	lb. *d*	...	.09½	.09½	.12	.12	.13
Butyl, secondary, tks, delv	lb. *d*	...	.07	.07	.096	...	.096
c-l, drs, delv	lb. *d*	...	.08	.08	.106	...	.106
Capryl, drs, tech, wks	lb.	...	.85	...	.85	...	.85
Cinnamic, bottles	lb.	2.50	3.65	2.50	3.65	3.25	3.65
Denatured, CD, No. 11, 12, 13, tks, c-l, drs, wks	gal. *e*	...	.33	.30	.44*	.34	.49*
Western schedule, c-l, wks	gal. *e*	...	.39	.39	.52*	.38	.52*
Denatured, SD, No. 1, tks, c-l, tks		...	.26	.23	.28	.29½	.31
c-l, drs, wks	gal. *e*	...	.29	.29	.34	.34½	.36
Diacetone, tech, tks, delv	lb. *f*	...	.16	...	.16	...	.16
c-l, drs, delv	lb. *f*	...	.17	...	.17	...	.17

a Powdered boric acid $5 a ton higher in each case; USP $15 higher; *b* Powdered citric is ½c higher; kegs are in each case ½c higher than bbls. *y* Price given is per gal.

c Yellow grades 25c per 100 lbs. less in each case; *d* Spot prices are 1c higher; *e* Anhydrous is 5c higher in each case; *f* Pure prices are 1c higher in each case; * Dealers were given 20% off this price.

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks.

		Current Market	1936 Low	1936 High	1935 Low	1935 High
Alcohols (continued)						
Ethyl, 190 proof, molasses, tks	gal. g	...	4.07	4.07	4.10	4.08½ 4.10
c-l, drs	gal. g	...	4.11	4.11	4.27	4.13½ 4.27
c-l, bbls	gal. g	...	4.12	4.12	4.28	4.15½ 4.28
absolute, drs	gal. g	4.54	6.08½	4.54	6.11½	4.55½ 6.11½
Furfuryl, tech, 500 lb drs	lb.	...	.35	...	.35	... .35
Hexyl, secondary tks, delv	lb.	...	.11½	...	.11½	... .11½
c-l, drs, delv	lb.	...	.12½	...	.12½	... .12½
Normal, drs, wks	lb.	3.25	3.50	3.25	3.50	3.25 3.50
Isoamyl, prim, cans, wks	lb.	...	.32	...	.32	... ...
drs, lcl, delvd	lb.	...	.27	...	.27	... ...
Isobutyl, refd, lcl, drs	lb.	...	.10	.10	.12	.12 .60
c-l, drs	lb.	...	.09½	.09½	.11½	... ...
tks	lb.	...	.08½	.08½	.10½	... ...
Isopropyl, refd, c-l, drs, f.o.b. wks, frt allowed	lb.	...	.45	.45	.55	... .55
Propyl, norm, 50 gal drs	gal.	...	.75	...	.75	... .75
Special Solvent, tks, wks	gal.	...	.27	.24	.32	... ...
Aldehyde ammonia, 100 gal drs	lb.	.80	.82	.80	.82	.80 .82
Alphanaphthol, crude, 300 lb bbls	lb.	...	.52	.52	.65	.60 .65
Alphanaphthylamine, 350 lb bbls	lb.	.32	.34	.32	.34	.32 .34
Alum, ammonia, lump, c-l, bbls, wks	100 lb.	...	3.00	...	3.00	... 3.00
25 bbls or more, wks	100 lb.	...	3.15	...	3.15	... 3.15
less than 25 bbls, wks	100 lb.	...	3.25	...	3.25	... 3.25
Granular, c-l, bbls, wks	100 lb.	...	2.75	...	2.75	... 2.75
25 bbls or more, wks	100 lb.	...	2.90	...	2.90	... 2.90
Powd, c-l, bbls, wks	100 lb.	...	3.15	...	3.15	... 3.15
25 bbls or more, wks	100 lb.	...	3.30	...	3.30	... 3.30
Chrome, bbls	100 lb.	7.00	7.25	7.00	7.25	7.00 7.25
Potash, lump, c-l, bbls, wks	100 lb.	...	3.25	...	3.25	... 3.25
25 bbls or more, wks	100 lb.	...	3.40	...	3.40	... 3.40
Granular, c-l, bbls, wks	100 lb.	...	3.40	...	3.40	... 3.00
25 bbls or more, bbls, wks	100 lb.	...	3.00	...	3.00	... 3.15
Powd, c-l, bbls, wks	100 lb.	...	3.40	...	3.40	... 3.40
25 bbls or more, wks	100 lb.	...	3.55	...	3.55	... 3.55
Soda, bbls, wks	100 lb.	4.00	4.15	4.00	4.15	4.00 4.15
Aluminum metal, c-l, NY	100 lb.	19.00	20.00	19.00	20.00	19.00 23.30
Acetate, CP, 20%, bbls	lb.	.09	.10	.09	.10	.09 .10
Chloride anhyd, 99%, wks	lb.	.07	.12	.07	.12	.07 .12
93%, wks	lb.	.05	.08	.05	.08	.05 .08
Crystals, c-l, drs, wks	lb.	.06	.06¼	.06	.07	.06½ .07
Solution, drs, wks	lb.	.02¾	.03¼	.02¾	.03½	.03 .03½
Hydrate, 96%, light, 90 lb bbls, delv	lb.	.13	.15	.13	.15	.13 .15
heavy, bbls, wks	lb.	.029	.03½	.029	.04½	.04 .04½
Oleate, drs	lb.	.16¾	.18½	.15¾	.18½	... .15¾
Palmitate, bbls	lb.	.21	.22	.21	.22	.20 .22
Resinate, pp., bbls	lb.	...	.15	...	.15	... .15
Stearate, 100 lb bbls	lb.	.19	.21	.18	.21	.17 .20
Sulfate, com, c-l, bgs, wks	100 lb.	...	1.35	...	1.35	... 1.35
c-l, bbls, wks	100 lb.	...	1.55	...	1.55	... 1.55
Sulfate, iron-free, c-l, bgs, wks	100 lb.	...	1.90	...	1.90	... 1.90
c-l, bbls, wks	100 lb.	...	2.05	...	2.05	... 2.05
Aminoazobenzene, 110 lb kgs	lb.	...	1.15	...	1.15	... 1.15
Ammonia anhyd com, tks	lb.	.04½	.05½	.04½	.05½	.04½ .05½
Ammonia anhyd, 100 lb cyl	lb.	.16	.22	.15¼	.22	.15¼ .21½
26°, 800 lb drs, delv	lb.	.02¼	.02½	.02¼	.03	.02½ .03
Aqua 26°, tks, NH	cont.	...	.04½	.04½	.05	... .05
tk wagon	lb.	...	.02	.02	.024	... .024
Ammonium Acetate, kgs	lb.	.26	.33	.26	.33	.26 .33
Bicarbonate, bbls, f.o.b. plant	100 lb.	5.15	5.71	5.15	5.71	5.15 5.71
Bifluoride, 300 lb bbls	lb.	.16	.17	.15	.17	.15 .17
carbonate, tech, 500 lb bbls	lb.	.08	.12	.08	.12	.08 .12
Chloride, White, 100 lb bbls, wks	100 lb.	4.45	4.90	4.45	4.90	4.45 4.90
Gray, 250 lb bbls, wks	lb.	5.00	5.75	5.00	5.75	5.00 5.75
Lump, 500 lbs cks spot	lb.	.10½	.11	.10½	.11	.10½ .11
Lactate, 500 lb bbls	lb.	.15	.16	.15	.16	.15 .16
Linoleate	lb.	.11	.12	.11	.12	.11 .12
Nitrate, tech, cks	lb.	.04	.05	.04	.05	.04 .05
Oleate, drs	lb.	...	.10	...	.10	... .10
Oxalate, neut, cryst, powd, bbls	lb.	.26	.27	.26	.27	.26 .27
pure, cryst, bbls, kgs	lb.	.27	.28	.27	.28	.27 .28
Perchlorate, kgs	lb.	...	.16	...	.16	... .16
Persulfate, 112 lb kgs	lb.	.21	.24	.21	.25	.22½ .25
Phosphate, dibasic tech, powd, 325 lb bbls	lb.	.07½	.10	.07½	.10	.08 .10
Stearate, drs	lb.	...	26.00	22.00	26.00	... ...
Sulfate, dom, f.o.b., bulk ton		...	25.50	22.00	26.00	20.00 24.00
200 lb bgs	ton	...	nom.	...	nom.	25.50 25.80
100 lb bgs	lb.	...	nom.	...	nom.	26.00 26.50
Sulfocyanide, kgs	lb.	...	.55	...	.55	... .50
Amyl Acetate (from pentane) tks, delv	lb.	...	.11½	.11½	.13½	... .13½
tech, drs, delv	lb.	.12½	.13½	.12½	.149	.142 .149
secondary, tks, delv	lb.	...	.108	...	.108	... .108
c-l, drs, delv	lb.	.118	.123	.118	.123	.118 .123
Amyl Chloride, norm drs, wks	lb.	.56	.68	.56	.68	.56 .68
Chloride, mixed, drs, wks	lb.	.07	.077	.07	.077	.07 .077
tks, wks	lb.	...	.06	...	.06	... .06
Mercaptan, drs, wks	lb.	...	1.10	...	1.10	... 1.10
Oleate, lcl, wks, drs	lb.	...	.25	...	...	... ...
Stearate, lcl, wks, drs	lb.	...	.26	...	...	... ...

g Grain alcohol 20c a gal. higher in each case.

		Current Market	1936 Low	1936 High	1935 Low	1935 High
Amylene, drs, wks	lb.	.102	.11	.102	.11	.102 .11
tks, wks	lb.	...	.09	...	.09	... .09
Aniline Oil, 960 lb drs and tks	lb.	.15	.17½	.15	.17½	.15 .17½
Annatto fine	lb.	.34	.37	.34	.37	.34 .37
Anthracene, 80%	lb.	...	.75	...	.75	... .75
40%	lb.	...	.18	...	.18	... .18
Anthraquinone, sublimed, 125 lb bbls	lb.	.50	.52	.50	.52	.50 .52
Antimony metal slabs, ton lots	lb.	.13¼	.14	.11⅜	.14	.12½ .16
Needle, powd, bbls	lb.	.11½	.12	.11	.12½	.09 .13½
Butter of, see Chloride.						
Chloride, soln cbys	lb.	.13	.17	.13	.17	.13 .17
Oxide, 500 lb bbls	lb.	.13	.13¾	.12¾	.14	.10¼ .15
Salt, 63% to 65%, tins	lb.	.22	.24	.22	.24	.22 .24
Sulfuret, golden, bbls	lb.	.22	.23	.22	.23	.19 .23
Vermilion, bbls	lb.	.35	.42	.35	.42	.35 .42
Archil, conc, 600 lb bbls	lb.	.21	.27	.21	.27	.21 .27
Double, 600 lb bbls	lb.	.18	.20	.18	.20	.18 .20
Triple, 600 lb bbls	lb.	.18	.20	.18	.20	.18 .20
Argols, 80%, casks	lb.	.14	.15	.14	.15	.15 .16
Crude, 30%, casks	lb.	.07	.08	.07	.08	.07 .08
Aroclors, wks	lb.	.18	.30	.18	.30	.18 .30
Arrowroot, bbl	lb.	.08¾	.09¾	.08¾	.09¾	.08¾ .09¾
Arsenic, Red, 224 lb cs kgs	lb.	...	.15¾	...	.15¾	... .15¾
White, 112 lb kgs	lb.	.03	.04	.03	.04½	.03½ .04½
Metal	lb.	.42	.44	.40	.44	.40 .42
Asbestine, c-l, wks	ton	13.00	15.00	13.00	15.00	13.00 15.00
Barium Carbonate precip, 200 lb bgs, wks	ton	56.50	61.00	56.50	61.00	56.50 61.00
Nat (witherite) 90% gr, c-l, wks, bgs	ton	42.00	45.00	42.00	45.00	42.00 45.00
Chlorate, 112 lb kgs NY	lb.	.15½	.17½	.15½	.17½	.14 .17½
Chloride, 600 lb bbl, wks	ton	72.00	74.00	72.00	74.00	72.00 74.00
Dioxide, 88%, 690 lb drs	lb.	.11	.12	.11	.12	.11 .12
Hydrate, 500 lb bbls	lb.	.05¼	.06	.05¼	.06	.05¼ .06
Nitrate, bbls	lb.	...	.07	.07	.08¼	... .08¼
Barytes, floated, 350 lb bbls wks	ton	23.65	31.15	23.65	31.15	23.00 31.15
Bauxite, bulk, mines	ton	7.00	10.00	7.00	10.00	7.00 10.00
Bentonite, c-l, No. 1, bgs, wks	ton	...	16.50	...	16.50	16.50 18.00
No. 2	ton	...	11.00	...	11.00	11.00 12.50
Benzaldehyde, tech, 945 lb drs, wks	lb.	.60	.62	.60	.62	.60 .62
Benzene (Benzol), 90%, Ind, 8000 gal tks, frt allowed	gal.	...	.16	.16	.18	.15 .18
90% c-l, drs	gal.	...	.23	...	.23	.23 .24
Ind Pure, tks, frt allowed	gal.	...	.16	.16	.18	.15 .18
Benzidine Base, dry, 250 lb bbls	lb.	.70	.72	.70	.74	.67 .69
Benzoyl Chloride, 500 lb drs	lb.	.40	.45	.40	.45	.40 .45
Benzyl Chloride, tech, drs	lb.	.30	.40	.30	.40	.30 .40
Beta-Naphthol, 250 lb bbl, wks	lb.	.24	.27	.24	.27	... .24
Naphthylamine, sublimed, 200 lb bbls	lb.	1.25	1.35	1.25	1.35	1.25 1.35
Tech, 200 lb bbls	lb.	.51	.52	.51	.55	.53 .55
Bismuth metal		1.00	1.10	1.00	1.10	.90 1.20
Chloride, boxes	lb.	3.20	3.25	3.20	3.25	3.20 3.25
Hydroxide, boxes	lb.	3.15	3.20	3.15	3.20	3.15 3.20
Oxychloride, boxes	lb.	2.95	3.00	2.95	3.00	2.95 3.00
Subbenzoate, boxes	lb.	3.25	3.30	3.25	3.30	3.25 3.30
Subcarbonate, kgs	lb.	1.40	1.45	1.40	1.45	1.55 1.70
Trioxide, powd, boxes	lb.	3.45	3.50	3.45	3.50	3.45 3.50
Subnitrate		1.30	1.35	1.30	1.35	1.30 1.45
Blackstrap, cane (see Molasses, Blackstrap).						
Blanc Fixe, 400 lb bbls, wks	ton h	42.50	70.00	42.50	70.00	42.50 70.00
Bleaching Powder, 800 lb drs, c-l, wks, contract	100 lb.	...	2.00	...	2.00	1.90 2.00
lcl, drs, wks	lb.	2.25	3.60	2.25	3.60	2.15 3.60
Blood, dried, f.o.b., NY	unit	...	4.25	2.50	4.25	2.50 3.25
Chicago, high grade	unit	...	4.50	2.90	4.50	2.50 3.75
Imported shipt	unit	...	no prices		2.60	3.75 2.75 3.30
Blues, Bronze Chinese Milori						
Prussian Soluble	lb.	.37	.38½	.37	.38½	.36½ .38
Ultramarine,* dry, wks, bbls	lb.	...	.10	...	.10	... ...
Regular grade, group 1	lb.	...	.15	...	.15	... ...
Special, group 1	lb.	...	.18	...	.18	... ...
Pulp, No. 1	lb.	...	.26	...	.26	... ...
Bone, 4½ + 50% raw, Chicago	ton	23.00	24.00	20.00	25.00	19.00 22.00
Bone Ash, 100 lb kgs	lb.	.06	.07	.06	.07	.06 .07
Black, 200 lb bbls	lb.	.05½	.08¼	.05½	.08¼	.05½ .08¼
Meal, 3% & 50%, imp	ton		26.00	23.00	26.00	22.75 24.00
Domestic, bgs, Chicago	ton	19.00	20.00	16.00	20.00	16.00 21.00
Borax, tech, gran, 80 ton lots, sacks, delv	ton i	...	40.00	...	40.00	36.00 40.00
bbls, delv	ton i	...	50.00	...	50.00	46.00 50.00
c-l, sacks, delv	ton i	...	44.00	...	44.00	40.00 44.00
c-l, bbls, delv	ton i	...	54.00	...	54.00	50.00 54.00
Tech, powd, 80 ton lots, sacks	ton i	...	45.00	...	45.00	41.00 45.00
bbls, delv	ton i	...	56.00	...	56.00	51.00 56.00
c-l, sacks, delv	ton i	...	49.00	...	49.00	45.00 49.00
c-l, bbls, delv	ton i	...	59.00	...	59.00	55.00 59.00
Bordeaux Mixture, consumers, East, c-l, tins, drs, cases	lb.	.10	.11	.08	.16	.08 .16
Dealers, East, c-l	lb.	.09½	.11½	.08½	.16½	.08½ .16½

h Lowest price is for pulp, highest for high grade precipitated; i Crystals $6 per ton higher; USP, $15 higher in each case; * Freight is equalized in each case with nearest producing point.

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FINE ARTS AND JEWELRY INSURANCE
FIRE INSURANCE SUPPLEMENTARY TO THESE LINES

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Bromine, cases .....lb.	.30	.43	.30	.43	.30	.43
Bronze, Al, pwd, 300 lb drs lb.	.80	1.50	.80	1.50	.80	1.50
Gold, blk .....lb.	.40	.55	.40	.55	.40	.55
Butanes, com 16-32° group 3 tks .....lb.	...	.04	...	.04	...	.04
Butyl, Acetate, norm drs, frt allowed .....lb.	.09½	.10	.09½	.12½	.12	.13½
tks, frt allowed .....lb.	...	.08½	.08½	.11	.11	.13
Secondary, tks, frt allowed .....lb.	...	.07½	.07½	.096	...	.096
drs, frt, allowed .....lb.	.08½	.09	.106	.111	.106	.111
Aldehyde, 50 gal drs, wks .....lb.	.19	.21	.19	.21	.19	.21
Carbinol, norm drs, wks lb.	.60	.75	.60	.75	.60	.75
Lactate, drs .....lb.	.22½	.23½	.22½	.23½	.22½	.23½
Propionate, drs .....lb.	.18	.18½	.18	.18½	.18	.18½
tks, delv .....lb.	...	.17	...	.17	...	.17
Stearate, 50 gal drs ....lb.	...	.26	...	.26	...	.26
Tartrate, drs .....lb.	.55	.60	.55	.60	.55	.60
Butyraldehyde, drs, lcl, wks lb.	...	.35½	...	...	...	...
Cadmium, Sulfide, boxes...lb.	.90	1.00	.90	1.10	.75	.85
Cadmium Metal .....lb.	...	1.05	.75	1.05	.55	.90
Calcium, Acetate, 150 lb bgs c-l, delv .....100 lb.	...	2.10	...	2.10	2.00	2.10
Arsenate, jobbers, East of Rocky Mts, drs .....lb.	.06	.06½	.06	.06½	.06	.06½
dealers, drs .....lb.	.06¼	.07¼	.06¼	.07¼	.06¼	.07¼
South, jobbers, drs .....lb.	.06	.06½	.06	.06½	.06	.06½
dealers, drs .....lb.	.06½	.06¾	.06½	.06¾	.06¼	.06¼
Carbide, drs .....lb.	.05	.06	.05	.06	.05	.06
Carbonate, tech, 100 lb bgs c-l .....lb.	1.00	1.00	1.00	1.00	1.00	1.00
Chloride, flake, 375 lb drs, c-l, delv. .....ton	...	22.00	...	22.00	...	19.50
Solid, 650 lb drs, c-l, delv. .....ton	...	20.00	...	20.00	...	17.50
Ferrocyanide, 350 lb bbls wks .....lb.	...	.17	...	.17	...	.17
Gluconate, Pharm, 125 lb bbls .....lb.	.50	.57	.50	.57	...	...
Nitrate, 100 lb bgs ....ton	...	26.50	...	26.50	...	26.50
Palmitate, bbls .....lb.	.21	.22	.21	.22	.20	.22
Peroxide, 100 lb drs ....lb.	...	1.25	...	1.25	...	1.25
Phosphate, tech, 450 lb bbls .....lb.	.07½	.08	.07½	.08	.07½	.08
Resinate, precip, bbls ...lb.	.13	.14	.13	.14	.13	.14
Stearate, 100 lb bbls ...lb.	.19	.21	.18	.21	.17	.20
Camphor, slabs .....lb.	...	.52	.50	.56	.49	.57
Powder .....lb.	...	.52	.4940	.56	.50	.57
Camwood, Bk, ground bbls lb.	.16	.18	.16	.18	.16	.18
Carbon, Decolorizing, drs c-l .....lb.	.08	.15	.08	.15	.08	.15
Black, c-l, bgs, delv, price varying with zone ....lb.	.0445	.0535	.0445	.0535	.0445	.0535
lcl, bgs, delv, all zones lb.	...	.07	...	.07	...	.07
cartons, delv .....lb.	...	.07¼	...	.07¼	...	.07¼
cases, delv .....lb.	...	.08¼	...	.08¼	...	.08¼
Bisulfide, 500 lb drs ....lb.	.05¼	.08	.05¼	.08	.05¼	.08
Dioxide, Liq 20-25 lb cyl lb.	.06	.08	.06	.08	.06	.08
Tetrachloride, 1400 lb drs, delv .....lb.	.05¼	.06	.05¼	.06	.05¼	.06
Casein, Standard, Dom, grd lb.	.19½	.20¾	.14½	.20¼	.09½	.16¾
80-100 mesh, c-l, bgs....lb.	.20	.21¼	.15	.21¼	.10	.17¼
Castor Pomace, 5½ NH_3, c-l, bgs, wks .....ton	...	20.00	15.00	20.00	16.00	18.50
Imported, ship, bgs ....ton	...	nom.	17.00	18.00	17.25	20.00
Celluloid, Scraps, ivory cs lb.	.17	.18	.17	.18	.17	.18
Transparent, cs .....lb.	...	.20	...	.20	...	.20
Cellulose, Acetate, 50 lb kgs .....lb.	.55	.60	.55	.60	.55	.60
Chalk, dropped, 175 lb bbls lb.	.03	.03¼	.03	.03¼	.03	.03¼
Precip, heavy, 560 lb cks lb.	.03	.04	.03	.04	.03	.04
Light, 250 lb cks .....lb.	.03	.04	.03	.04	.03	.04
Charcoal, Hardwood, lump, blk, wks .....bu.	...	.15	...	.15	...	.15
Willow, powd, 100 lb bbl, wks .....lb.	.06	.06¼	.06	.06¼	.06	.06¼
bgs, delv* .....ton	27.00	30.40	24.40	30.40	22.40	30.00
Chestnut, clarified bbls, wks lb.	...	.01625	.01625	.01⅞	...	.01⅞
25%, tks, wks .....lb.	...	.02	.01½	.02	...	.01½
Pwd, 60%, 100 lb bgs, wks .....lb.	...	.04⅞	...	.04⅞	...	.04⅞
China Clay, c-l, blk mines ton	...	7.00	...	7.00	...	7.00
Powdered, bbls .....lb.	.01	.02	.01	.02	.01	.02
Pulverized, bbls, wks ..ton	10.00	12.00	10.00	12.00	10.00	12.00
Imported, lump, blk ...ton	15.00	25.00	15.00	25.00	15.00	25.00
Chlorine, cyls, lcl, wks, contract .....lb.	.07½	.08½	.07½	.08½	.07½	.08½
cyls, c-l, contract ...lb. *j*	...	.05½	...	.05½	...	.05½
Liq, tk, wks, contract 100 lb.	...	2.15	...	2.15	2.00	2.15
Multi, c-l, cyls, wks, cont .....lb.	2.30	2.55	2.30	2.55	2.30	2.40
Chloroacetophenone, tins, wks .....lb.	...	2.00	...	2.00	...	2.00
Chlorobenzene, Mono, 100 lb drs, lcl, wks .....lb.	.06	.07½	.06	.07½	.06	.07½
Chloroform, tech, 1000 lb drs .....lb.	.20	.21	.20	.21	.20	.21
USP, 25 lb tins .....lb.	.30	.31	.30	.31	.30	.31
Chloropicrin; comml cyls..lb.	.85	.90	.85	.90	.85	.90
Chrome, Green, CP .....lb.	.20	.23	.21½	.23	.17	.30
Yellow .....lb.	.13	.14	.11	.14	.11	.16
Chromium, Acetate, 8% Chrome, bbls .....lb.	.06	.08	.06	.08	.05	.05¼
20° soln, 400 lb bbls ...lb.	...	.05½	...	.05½	...	.05½
Fluoride, powd, 400 lb bbl .....lb.	.27	.28	.27	.28	.27	.28

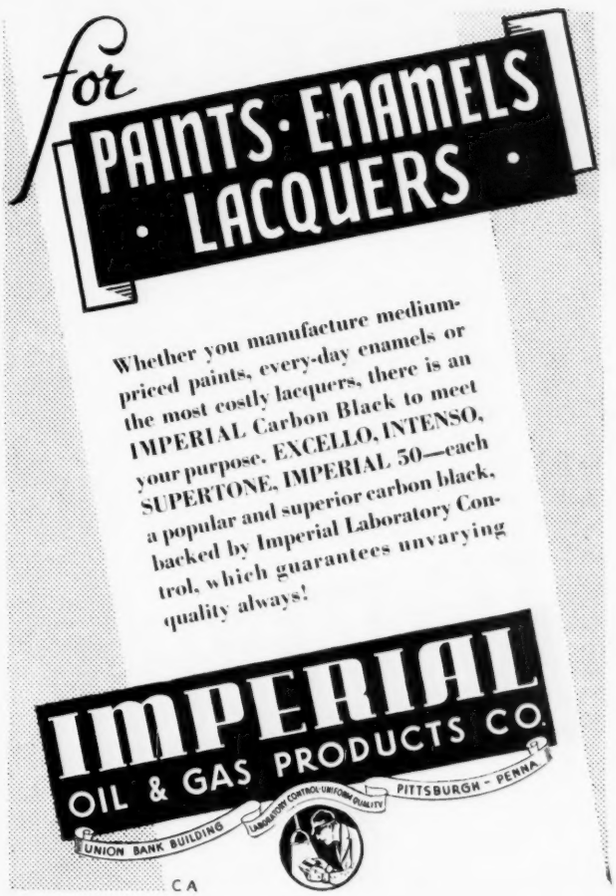
j A delivered price; * Depends upon point of delivery.

Current

Coal Tar Diphenylguanidine

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Coal tar, bbls .....bbl.	7.25	9.00	7.25	9.00	7.25	9.00
Cobalt Acetate, bbls .....lb.	...	.58	.58	.60	...	.60
Carbonate tech, bbls ....lb.	1.42¾	1.48	1.35	1.48	1.35	1.40
Hydrate, bbls .....lb.	1.66	1.76	1.66	1.76	1.66	1.76
Linoleate, paste, bbls ...lb.	...	.31¼	.30	.31¼	...	.30
Resinate, fused, bbls ...lb.	...	.13	.12½	.13	...	.12½
Precipitated, bbls .....lb.	...	.32	...	.32	...	.32
Oxide, black, bgs .....lb.	1.41	1.51	1.29	1.49	1.25	1.49
Cochineal, gray or bk bgs..lb.	.32	.36	.32	.36	.32	.39
Teneriffe silver, bgs ....lb.	.33	.37	.33	.37	.33	.40
Copper, metal, electrol 100 lb.	...	12.00	9.50	12.00	8.00	9.25
Carbonate, 400 lb bbls ..lb.	...	.08¼	...	.08¼	...	.08¼
52-54% bbls .....lb.	.14½	.16¼	.14½	.16¼	.14½	.16¼
Chloride, 250 lb bbls ...lb.	.17	.18	.17	.18	.17	.18
Cyanide, 100 lb drs ....lb.	.37	.38	.37	.38	.37	.38
Oleate, precip, bbls ....lb.	...	.20	...	.20	...	.20
Oxide, red, 100 lb bbls..lb.	.14	.15	.14	.15	.15	.17
black bbls, wks .....lb.	.15¼	.15¾	.14½	.15¾	.14	.16½
Resinate, precip, bbls ...lb.	.18	.19	.18	.19	.18	.19
Stearate, precip, bbls ..lb.	.35	.40	.35	.40	.35	.40
Sub-acetate verdigris, 400 lb bbls .....lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls, c-l, wks 100 lb.	...	4.55	3.85	4.55	...	3.85
Copperas, crys and sugar bulk c-l, wks, bgs .....ton	14.00	16.00	13.00	16.00	12.00	14.00
Corn Syrup, 42 deg, bbls 100 lb.	...	3.80	3.05	3.95	3.18	3.63
43 deg, bbls .....100 lb.	...	3.90	3.10	4.05	3.23	3.68
Corn Sugar, tanners, bbls 100 lb.	3.78	3.88	3.08	4.03	3.46	3.66
Cotton, Soluble, wet, 100 lb bbls .....lb.	.40	.42	.40	.42	.40	.42
Cream Tartar, USP, powd & gran, 300 lb bbls ....lb.	...	.15	.15	.16¾	.16¾	.17¼
Creosote, USP, 42 lb cbys lb.	.45	.47	.45	.47	.45	.47
Oil, Grade 1, tks .....gal.	.13	.13½	.12½	.13½	.11½	.13½
Grade 2 .....gal.	.113	.12½	.109	.12	.10½	.12
Cresol, USP, drs .....lb.	.10	.10½	.10	.10½	.10	.11½
Crotonaldehyde, 98%, drs, wks .....lb.	.26	.30	.26	.30	.32	.36
Cudbear, English .....lb.	.19	.25	.19	.25	.19	.25
Cutch, Philippine, 100 lb bale lb.	.04	.04¾	.04	.04¾	.03½	.04¾
Cyanamid, bgs, c-l, frt allowed Ammonia unit	...	1.10	1.07½	1.10	...	1.07½
Derris root 5% rotenone, bbls .....lb.	.39	.47	...	...	...	...
Dextrin, corn, 140 lb bgs f.o.b., Chicago ...100 lb.	...	4.63	3.45	5.00	3.60	4.15
British Gum, bgs ...100 lb.	...	5.08	3.70	5.40	3.85	4.50
White, 140 lb bgs ..100 lb.	...	4.68	3.40	4.95	3.50	4.10
Potato, Yellow, 220 lb bgs lb.	.07¾	.08¾	.07¾	.08¾	.07¾	.08¾
White, 220 lb bgs, lcl..lb.	.08	.09	.08	.09	.08	.09
Tapioca, 200 bgs, lcl ....lb.	...	.08	...	.08	.08	.08¾
Diamylamine, drs, wks ...lb.	...	.75	.75	1.00	...	1.00
Diamylene, drs, wks .....lb.	.095	.102	.095	.102	.095	.102
tks, wks .....lb.	...	.08½	...	.08½	...	.08½
Diamylether, wks, drs ....lb.	.085	.092	.085	.092	.085	.092
tks, wks .....lb.	...	.075	...	.075	...	.075
Oxalate, lcl, drs, wks...lb.	...	.30	...	...	...	...
Diamylphthalate, drs wks gal.	.19	.19½	.18	.19½	.18	.20½
Diamyl Sulfide, drs, wks ..lb.	...	1.10	...	1.10	...	1.10
Dianisidine, bbls .....lb.	2.25	2.45	2.25	2.45	2.25	2.45
Dibutyl Ether, drs, wks, lcl lb.	...	.22	...	...	...	...
Dibutylphthalate, drs, wks, frt allowed .....lb.	.19½	.20	.18	.21	.20	.23
Dibutyltartrate, 50 gal drs lb.	.35	.40	.35	.40	.35	.40
Dichlorethylene, drs .....gal.	.29	...	.29	...	.29	...
Dichloroethylether, 50 gal drs, wks .....lb.	.16	.17	.16	.17	.16	.17
tks, wks .....lb.	...	.15	...	.15	...	.15
Dichloromethane, drs, wks lb.	...	.23	...	.23	.15	.23
Dichloropentanes, drs, wks lb.	.032	.040	.032	.040	.032	.040
tks, wks .....lb.	...	.02½	...	.02½	...	.02½
Diethanolamine, tks, wks..lb.	...	.30	...	.30	...	...
Diethylamine, 400 lb drs ..lb.	2.75	3.00	2.75	3.00	2.75	3.00
Diethyl Carbinol, drs .....lb.	.60	.75	.60	.75	.60	.75
Diethylcarbonate, com drs lb.	.31⅓	.35	.31⅓	.35	.31⅓	.35
90% grade, drs .....lb.	...	.25	...	.25	...	.25
Diethylaniline, 850 lb drs..lb.	.50	.52	.50	.55	.52	.55
Diethylorthotoluidin, drs ..lb.	.64	.67	.64	.67	.64	.67
Diethyl phthalate, 1000 lb drs lb.	.18	.18½	.18	.19	.18½	.27
Diethylsulfate, tech, drs, wks, lcl .....lb.	...	.20	...	.20	...	...
Diethyleneglycol, drs ....lb.	.16½	.17½	.15½	.17½	.15½	.17½
Mono ethyl ethers, drs..lb.	.16	.17	.15	.17	.15	.17
tks, wks .....lb.	...	.15	...	.15	...	.15
Mono butyl ether, drs ..lb.	...	.26	...	.26	...	.26
Diethylene oxide, 50 gal drs, wks .....lb.	.20	.24	.20	.24	.20	.27
Diglycol Oleate, bbls ....lb.	...	.24	...	.24	.16	.24
Dimethylamine, 400 lb drs, pure 25 & 40% sol 100% basis .....lb.	...	.95	...	.95	...	.95
Dimethylaniline, 340 lb drs lb.	.26	.27	.26	.30	.29	.30
Dimethyl Ethyl Carbinol, drs lb.	.60	.75	.60	.75	.60	.75
Dimethyl phthalate, drs, wks, frt allowed .....lb.	.19½	.20	.19½	.21½	.20½	.24½
Dimethysulfate, 100 lb drs lb.	.45	.50	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls lb. *k*	.16	.19	.16	.19½	.17	.19½
Dinitrochlorobenzene, 400 lb bbls .....lb.	.14	.15½	.14	.15½	.14	.15½
Dinitronaphthalene, 350 lb bbls .....lb.	.34	.37	.34	.37	.34	.37
Dinitrophenol, 350 lb bbls lb.	.23	.24	.23	.24	.23	.24
Dinitrotoluene, 300 lb bbls lb.	.14½	.15½	.14½	.16½	.15½	.16½
Diphenyl .....lb.	.15	.25	.15	.25	.15	.25
Diphenylamine .....lb.	.31	.32	.31	.32	.31	.32
Diphenylguanidine, 100 lb bbl .....lb.	.35	.37	.35	.37	.36	.37

k Higher price is for purified material.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Cobalt Carbonate
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Sodium Silico Fluoride
Sodium Stannate
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Dip Oil
Glycerin

Prices

	Current Market	1936 Low	1936 High	1935 Low	1935 High
Dip Oil, see Tar Acid Oil.					
Divi Divi pods, bgs shipmt ton	32.00	35.00	32.00	45.00	36.00	40.00
Extract lb.	.05	.05½	.05	.05½	.05	.05½
Egg Yolk, dom., 200 lb cases lb.	...	.68	.63	.68	.46	.63
Imported lb.	.52	.55	.48	.56	...	...
Epsom Salt, tech, 300 lb bbls c-l NY 100 lb.	1.80	2.00	1.80	2.00	1.80	2.25
USP, c-l, bbls 100 lb.	...	2.00	...	2.00	2.00	2.25
Ether, USP anaesthesia 55 lb drs lb.	.22	.23	.22	.23	.22	.23
(Conc) lb.	.09	.10	.09	.10	.09	.10
Ether, Isopropyl 50 gal drs lb.	.07	.08	.07	.08	.07	.08
tks, frt allowed lb.	...	.06	...	.06	...	.06
Nitrous, conc, bottles lb.	.75	.77	.75	.77	.75	.77
Synthetic, wks, drs lb.	.08	.09	.08	.09	.08	.09
Ethyl Acetate, 85% Ester tks, frt alld lb.	...	.06½	.06½	.08	.07½	.08
drs, frt alld lb.	...	.07½	.07½	.09	.08½	.09
Anhydrous, tks, frt alld lb.	...	.07½	.07	.08½	...	.08½
drs, frt alld lb.	...	.08½	.08	.10	.09½	.10
Acetoacetate, 110 gal drs lb.	...	.37	.37	.68	.65	.68
Benzylaniline, 300 lb drs lb.	.86	.88	.86	.90	.88	.90
Bromide, tech, drs lb.	.50	.55	.50	.55	.50	.55
Chloride, 200 lb drs lb.	.22	.24	.22	.24	.22	.24
Chlorocarbonate cbys lb.	...	.30	...	.30	...	.30
Crotonate, drs lb.	1.00	1.25	1.00	1.25	1.00	1.25
Ether, Absolute, 50 gal drs lb.	.50	.52	.50	.52	.50	.52
Lactate, drs, wks lb.	.25	.29	.25	.29	.25	.29
Methyl Ketone, 50 gal drs, frt allowed lb.	.07	.07½	.07	.09	.08½	.09
tks, frt allowed lb.	...	.06½	.06½	.07½	...	.07½
Oxalate, drs, wks lb.	.37½	.55	.37½	.55	.37½	.55
Oxybutyrate, 50 gal drs, wks lb.	.30	.30½	.30	.30½	.30	.30½
Ethylene Dibromide, 60 lb drs lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys chloro, cont lb.	.75	.85	.75	.85	.75	.85
Anhydrous lb.	...	.75	...	.75	...	...
Dichloride, 50 gal drs, wks lb.	.0545	.0994	.0545	.0994	.0545	.0994
Glycol, 50 gal drs, wks lb.	.17	.21	.17	.21	.17	.28
tks, wks lb.	...	.16	...	.16	...	...
Mono Butyl Ether, drs, wks lb.	.20	.21	.20	.21	.20	.21
tks, wks lb.	...	.19	...	.19	...	.19
Mono Ethyl Ether, drs, wks lb.	.16	.17	.16	.17	.16	.17
tks, wks lb.	...	.15	...	.15	...	.15
Mono Ethyl Ether Acetate, drs, wks lb.	...	.14	.14	.18½	.17½	.18½
tks, wks lb.	...	.13	.13	.16½	...	.16½
Mono, Methyl Ether, drs wks lb.	.19	.23	.19	.23	.19	.23
tks, wks lb.	...	.18	...	.18	...	...
Stearate	.18	.18	.18	.18	.18	.18
Oxide, cyl lb.	.50	.55	.50	.60	.55	.75
Ethylidenaniline lb.	.45	.47½	.45	.47½	.45	.47½
Feldspar, blk pottery ton	...	14.50	...	14.50	...	14.50
Powd, blk, wks ton	14.00	14.50	14.00	14.50	14.00	14.50
Ferric Chloride, tech, crys, 475 lb bbls lb.	.05	.07½	.05	.07½	.05	.07½
sol, 42° cbys lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Fish Scrap, dried, unground, wks unit *l*	...	nom.	2.50	3.50	2.25	2.90
Acid, Bulk, 6 & 3%, delv Norfolk & Baltimore basis unit *m*	...	nom.	...	2.25	2.00	2.35
Fluorspar, 98%, bgs lb.	30.00	35.50	30.00	35.50	28.00	35.50
Formaldehyde, USP, 400 lb bbls, wks lb.	.05¾	.06¼	.05¾	.07	.06	.07
Fossil Flour lb.	.02½	.04	.02½	.04	.02½	.04
Fullers Earth, blk, mines ton	6.50	15.00	6.50	15.00	6.50	15.00
Imp powd, c-l, bgs ton	23.00	30.00	23.00	30.00	23.00	30.00
Furfural (tech) drs, wks lb.	.10	.15	.10	.15	.10	.15
Furfuramide (tech) 100 lb drs lb.	...	.30	...	.30	...	.30
Fusel Oil, 10% impurities lb.	.16	.18	.16	.18	.16	.18
Fustic, chips lb.	.04	.05	.04	.05	.04	.05
Crystals, 100 lb boxes lb.	.20	.23	.20	.23	.20	.23
Liquid 50°, 600 lb bbls lb.	.08½	.12	.08½	.12	.08½	.12
Solid, 50 lb boxes lb.	.16	.18	.16	.18	.16	.18
Sticks ton	25.00	26.00	25.00	26.00	25.00	26.00
G Salt paste, 360 lb bbls lb.	.45	.47	.45	.47	.42	.43
Gall Extract lb.	.18	.20	.18	.20	.18	.20
Gambier, com 200 lb bgs lb.	...	.06	...	.06	.05	.08
Singapore cubes, 150 lb bgs 100 lb.	.08	.09	.08	.09	.07⅛	.09⅛
Gelatin, tech, 100 lb cs lb.	.50	.55	.50	.55	.50	.55
Glauber's Salt, tech, c-l, bgs, wks* 100 lb.	.95	1.15	.95	1.30	1.10	1.30
Anhydrous, see Sodium Sulfate.						
Glue, bone, com grades, c-l bgs lb.	.11	.17½	.10½	.17½	...	...
Better grades, c-l, bgs lb.	.12½	.17½	.12	.17½	...	...
Casein, kgs lb.	.18	.22	.18	.22	.18	.22
Glycerin, CP, 550 lb drs lb.	...	.21½	.16	.21½	.14	.14½
Dynamite, 100 lb drs lb.	...	.21½	.13¾	.21½	.13¾	.14¼
Saponification, drs lb.	.17½	.18½	.10¼	.22	.10	.11½
Soap Lye, drs lb.	.16	.17	.09¼	.20	.09	.10

l + 10; *m* + 50; * Bbls. are 20c higher.

Current — Glyceryl Phthalate Gum, Hemlock

		Current Market	1936 Low	1936 High	1935 Low	1935 High
Glyceryl Phthalate	lb.	...	.29	.28	.29	... .28
Glyceryl Stearate, bbls	lb.	...	.18	..	.18	.... .18
Glycol Phthalate	lb.	...	.29	.29	.35	.28 .29
Glycol Stearate	lb.	...	.23	...	.23	.18 .23
Graphite:						
Crystalline, 500 lb bbls.	lb.	...	.06¼	.04	.06¼	.04 .05
Flake, 500 lb. bbls	lb.	...	.06	.06¼	.08	.08 .16
Amorphous, bbls	lb.	.03½	.04½	.03	.04½	.03 .04
GUMS						
Gum Aloes, Barbadoes	lb.	.85	.90	.85	.90	.85 .90
Arabic, amber sorts	lb.	.09¾	.10	.09	.10¾	.09½ .15
White sorts, No. 1, bgs.	lb.	.27	.28	.25	.28	.21 .27
No. 2, bgs	lb.	.25	.26	.24	.26	.19 .26
Powd, bbls	lb.	.13	.14	.13	.14	.13¼ .18
Asphaltum, Barbadoes (Manjak) 200 lb bgs, f.o.b., NY	lb.	.02½	.10½	.02½	.10½	.02½ .10½
Egyptian, 200 lb cases, f.o.b., NY	lb.	.12	.15	.12	.15	.12 .15
California, f.o.b., NY, drs	ton	29.00	55.00	29.00	55.00	29.00 55.00
Benzoin Sumatra, USP, 120 lb cases	lb.	...	nom.	.15	.19	.19 .28
Copal, Congo, 112 lb bgs, clean, opaque	lb.	...	.19½	.18½	.20	.19½ .24⅜
Dark amber	lb.	...	.06⅞	.06⅞	.08	.07¼ .09¼
Light amber	lb.	...	.10¼	.10¼	.14⅛	.11½ .14⅜
Copal, East India, 180 lb bgs						
Macassar pale bold	lb.	.12⅜	.13¼	.12⅜	.14	.09½ .10¾
Chips	lb.	...	.06½	.06⅛	.06½	.05½ .06
Nubs	lb.	...	.10⅜	.10⅜	.11⅛	... ...
Dust	lb.	.03⅜	.04⅛	.03⅜	.04⅛	.03⅜ .04½
Singapore						
Bold	lb.	...	.15½	.15⅜	.16⅞	.12⅜ .17
Chips	lb.	...	.04⅜	.04⅜	.05¼	.04⅜ .05⅝
Nubs	lb.	...	.10	.10	.11¼	.10 .11¾
Dust	lb.	.03⅜	.04⅛	.03⅜	.04⅛	.03⅜ .05½
Copal Manilla, 180-190 lb baskets, Loba A	lb.	...	.09¾	.09¼	.13	.11¾ .13
Loba B	lb.	...	.09¼	.08⅞	.12	.10¼ .12
Loba C	lb.	...	.08⅞	.08⅜	.11⅛	.10⅜ .11½
MA sorts	lb.	...	.06¾	.06¼	.07⅜	.06 .07⅜
DBB	lb.	...	.08	.07⅝	.08⅞	.08 .09
Dust	lb.	...	.05	.05	.06⅛	.04⅞ .06⅛
Copal Pontianak, 224 lb cases, bold genuine	lb.	...	.14½	.14¼	.16	.14⅜ .16⅜
Mixed	lb.	.13¼	.13¾	.13¼	.13¾	.12⅞ .14⅞
Chips	lb.	...	.08½	.07	.08½	.06⅞ .08¼
Nubs	lb.	...	.12	.10¼	.12	.09⅜ .11¾
Split	lb.	...	.12¾	.12¾	.13	.12⅜ .13⅞
Dammar Batavia, 136 lb cases						
A	lb.	...	.22¼	.21⅜	.22¼	.19 .21⅞
B	lb.	...	.20¾	.20⅜	.21½	.18 .20⅞
C	lb.	...	.17⅛	.16½	.17⅝	.16 .17
D	lb.	...	.14¾	.13⅝	.14⅜	.11¾ .14⅛
A/D	lb.	...	.17⅛	.15½	.17⅞	.14 .16
A/E	lb.	...	.14½	.12⅞	.14½	.11¾ .13¾
E	lb.	...	.07⅛	.06¾	.07⅛	.07 .07¼
F	lb.	...	.05⅞	.05⅞	.06⅞	.06⅛ .06⅞
Singapore						
No. 1	lb.	...	.17⅛	.16¼	.17½	.15⅜ .19
No. 2	lb.	...	.14⅛	.13	.14¼	.10⅝ .14⅞
No. 3	lb.	.05¼	.05¾	.05¼	.05¾	.04⅜ .05⅞
Chips	lb.	...	.09¾	.09¾	.09¾	.08⅞ .09¾
Dust	lb.	...	.05	.04¼	.05⅝	.04¾ .05⅞
Seeds	lb.	...	.07⅜	.06⅝	.07⅜	.04¾ .07¼
Elemi, cons	lb.	.09¾	.10¼	.09¾	.10¼	... ...
Ester	lb.	...	.10	.07⅝	.10	.07¼ .08⅜
Gamboge, pipe, cases	lb.	.58	.59	.58	.59	.55 .65
Powd, bbls	lb.	.65	.66	.65	.66	.65 .75
Ghatti, sol. bgs	lb.	.11	.15	.11	.15	.09 .15
Karaya, powd, bbls, xxx	lb.	.24	.25	.24	.25	.23 .25
xx	lb.	.16	.17	.16	.17	.15 .17
No. 1	lb.	.09½	.10	.09½	.10	.08 .10
No. 2	lb.	.08½	.09	.08½	.09	.07 .09
Kauri, NY, San Francisco, Brown XXX, cases	lb.	.60	.60½	.60	.60½	.60 .60½
BX	lb.	.33	.33½	.33	.33½	.33 .33½
B1	lb.	...	.21	.19	.21	.19 .19½
B2	lb.	...	.15½	.14½	.15½	.14½ .15
B3	lb.	.12	.12½	.12	.12½	.12 .12½
Pale XXX	lb.	.65	.65½	.65	.65½	.65 .65½
No. 1	lb.	.40	.40½	.40	.40½	.40 .40½
No. 2	lb.	.22	.22½	.22	.22½	.22 .22½
No. 3	lb.	.15	.15½	.15	.15½	.15 .15½
Kino, tins	lb.	.70	.80	.70	.80	.70 .80
Mastic	lb.	.57	.58	.56	.60½	.46 .60½
Sandarac, prime quality, 200 lb bgs & 300 lb cks	lb.	.33	.35	.19½	.38	.26¼ .35½
Senegal, picked bgs	lb.	.20	.21	.20	.21	.20 .21
Sorts	lb.	.09¾	.10¼	.09¾	.12½	.09⅜ .12½
Thus, bbls	280 lbs.	...	12.00	11.00	12.00	10.50 11.00
Strained	280 lbs.	...	12.00	11.00	12.00	10.50 11.00
Tragacanth, No. 1, cases	lb.	2.40	2.50	1.20	2.50	1.15 1.30
No. 2	lb.	2.00	2.10	1.10	2.10	1.05 1.20
No. 3	lb.	1.95	2.05	.95	2.05	.95 1.05
No. 4	lb.	1.85	1.95	.85	1.95	.85 .95
No. 5	lb.	1.65	1.75	.75	1.75	.75 .85
No. 6, bgs	lb.	.30	.31	.18	.31	.14 .19
Sorts, bgs	lb.	.30	.35	.25	.30	.11 .25
Yacca, bgs	lb.	.03¼	.03¾	.03¼	.03¾	.03¼ .03¾
Helium, cyl (200 cu. ft.)	cyl.	...	25.00	...	25.00	... 25.00
Hematite crystals, 400 lb bbls	lb.	.16	.18	.16	.18	.16 .18
Paste, 500 bbls	lb.	...	.11	...	.11	... .11
Hemlock, 25%, 600 lb bbls, wks	lb.	...	.02⅞	...	.02⅞	... .02⅞
tks	lb.	...	.02½	...	.02½	... .02½

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NEW YORK
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Acetate of Lime
Acetate of Soda
Acetone C. P.
Methanol
(all grades)
Methyl Acetone
Denatured Alcohol
Formaldehyde
Turpentine
Rosin
Phenol U. S. P.
Benzol
Toluol
Xylol
Whiting
Magnesium Carbonate
Magnesium Oxide
Sodium Silico Fluoride

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MANUFACTURERS OF
"Baker's Analyzed"
C. P. CHEMICALS AND ACIDS

Hexalene
Meta-nitro-paratoluidine

Prices

	Current Market	1936 Low	1936 High	1935 Low	1935 High
Hexalene, 50 gal drs, wks lb.	...	.30	...	.30	...	.30
Hexane, normal 60-70°C.						
Group 3, tks .....gal.	...	.12	...	.12	...	.14
Hexamethylenetetramine,						
powd, drs .....lb.	.35	.36	.35	.39	.37	.39
Hexyl Acetate, delv, drs ..lb.	...	.10	.10	.12½	.12	.12½
tks .....lb.	...	.09	.09	.11½	...	.11½
Hoof Meal, f.o.b. Chicago unit	...	3.00	2.35	3.00	2.50	2.70
Hydrogen Peroxide, 100 vol,						
140 lb cbys .....lb.	.20	.21	.20	.21	.20	.21
Hydroxyamine Hydrochloride						
.....lb.	...	3.15	...	3.15	...	3.15
Hypernic, 51°, 600 lb bbls lb.	.17	.20	.17	.20	.17	.20
Indigo, Madras, bbls .....lb.	1.25	1.30	1.25	1.30	1.25	1.30
20% paste, drs .....lb.	.15	.18	.15	.18	.15	.18
Synthetic, liquid .....lb.	.13	.14	.13	.14	...	.12
Iodine, Resublimed, kgs...lb.	1.50	1.55	1.50	1.75	...	1.90
Irish Moss, ord, bales ....lb.	.09	.10	.09	.10	.09	.10
Bleached, prime, bales ..lb.	.18	.19	.18	.19	.18	.19
Iron Acetate Liq. 17°, bbls lb.	.03	.04	.03	.04	.03	.04
Chloride see Ferric Chloride.						
Nitrate, coml, bbls ..100 lb.	2.75	3.25	2.75	3.25	2.75	3.25
Oxide, English .....lb.	.07½	08¾	.07½	.08¾	.07½	.08¾
Isobutyl Carbinol (128-132°C)						
drs, wks .....lb.	.33	.34	.33	.34	.33	.34
tks, wks .....lb.	...	.32	...	.32	...	.32
Isopropyl Acetate, tks, frt						
allowed .....lb.	...	.06½	.06	.07½	...	.07½
drs, frt allowed .....lb.	.07½	.08	.07	.09	.08½	.09
Ether, see Ether, isopropyl.						
Keiselguhr, 95 lb bgs, NY,						
Brown .....ton	60.00	70.00	60.00	70.00	60.00	70.00
Lead Acetate, brown, broken,						
f.o.b. NY, bbls .....lb.	...	.10	.09½	.10	...	.09½
White, broken, bbls ..lb.	...	.11½	.11	.11½	...	.11
cryst, bbls .....lb.	...	.11½	.10½	.11½	...	.10½
gran, bbls .....lb.	...	.12¼	.11	.12¼	...	.11
powd, bbls .....lb.	...	.12¼	.11¼	.12¼	...	.11¼
Arsenate, East, consumers,						
drs .....lb.	...	.10	.09	.10	.09	.09½
Dealers, drs .....lb.	.09½	.10	.09¼	.10¾	.09¼	.10¼
West. consumers, drs lb.	...	.09¾	.09	.09¾	...	.09
Dealers, drs .....lb.	...	.09½	.09½	.10	...	.10
Linoleate, solid, bbls ...lb.	...	.18	.18	.26½	.26	.26½
Metal, c-l, NY .....100 lb.	...	6.00	4.50	6.00	3.50	4.50
Red, dry, 95% Pb_3O_4,						
delv .....lb.	...	.085	.07	.085	.06	.08
97% Pb_3O_4, delv .....lb.	...	.08¾	.07¼	.08¾	.06¼	.08¼
98% Pb_3O_4, delv .....lb.	...	.09	.07½	.09	.06½	.08½
Nitrate, 500 lb bbls, wks lb.	.09	.09½	.09	.09½	.10	.14
Oleate, bbls .....lb.	.15	.16	.15	.16	.15	.16
Resinate, precip, bbls ...lb.	...	.14	...	.14	...	.14
Stearate, bbls .....lb.	.22	.23	.22	.23	.22	.23
Titanate, bbls, c-l, f.o.b.						
wks, frt allowed.....lb.	...	.10	...	...	...	...
White, 500 lb bbls, wks..lb.	...	.07¼	.06½	.07¼	.06½	.07
Sulfate, 500 lb bbls, wks lb.	...	.06½	.06	.06½	...	.06
Lime, chemical quicklime,						
f.o.b., wks, bulk .....ton	7.00	7.25	7.00	7.25	7.00	7.25
Hydrated, f.o.b., wks ..ton	9.00	12.00	8.50	12.00	8.50	12.00
Lime Salts, see Calcium Salts.						
Lime sulfur, dealers, tks..gal.	...	.11	...	.11	.10½	.11
drs .....gal.	.13	.16	.13	.16	.13	.16½
Dry, bgs, jobbers.....lb.	.07¼	.10¼	.07¼	.10¼	...	...
Linseed Meal, bgs .....ton	...	40.00	29.00	40.50	25.50	40.00
Litharge, coml, delv, bbls..lb.	...	.075	.06	.075	.05	.07
Lithopone, dom, ordinary,						
delv, bgs .....lb.	.04¼	.04½	.04½	.04¾	.04½	.04¾
bbls .....lb.	.04½	.04¾	.04½	.05	.04¾	.05
High strength, bgs .....lb.	.05¾	.06	.05¾	.06¼	.06	.06¼
bbls .....lb.	.06	.06¼	.06	.06½	.06¼	.06½
Titanated, bgs .....lb.	.05¾	.06	.05¾	.06¼	.06	.06¼
bbls .....lb.	.06	.06¼	.06	.06½	.06¼	.06½
Logwood, 51°, 600 lb bbls lb.	.06½	.10¼	.06½	.10½	.08½	.10½
Solid, 50 lb boxes .....lb.	.13½	.17½	.13½	.17¼	.13½	.17½
Sticks .....ton	24.00	26.00	24.00	26.00	24.00	26.00
Madder, Dutch .....lb.	.22	.25	.22	.25	.22	.25
Magnesite, calc, 500 lb bbl ton	60.00	65.00	60.00	65.00	60.00	65.00
Magnesium Carb, tech, 70 lb						
bgs, wks .....lb.	.06	.06½	.06	.06½	.06	.06½
Chloride flake, 375 lb drs,						
c-l, wks .....ton	39.00	42.00	36.00	42.00	36.00	39.00
Magnesium fluosilicate, crys,						
400 lb bbls, wks .....lb.	.10	.10½	.10	.10½	.10	.10½
Oxide, USP, light, 100 lb						
bbls .....lb.	...	.42	...	.42	...	.42
Heavy, 250 lb bbls .. lb.	...	.50	...	.50	...	.50
Palmitate, bbls .....lb.	.23	.24	.23	.24	.22	.24
Stearate, bbls .....lb.	.21	.24	.20	.24	.19	.22
Linoleate, lig drs .....lb.	.18	.19	.18	.19	.18	.19
Resinate, fused, bbls ...lb.	.08¼	.08½	.08¼	.08½	.08¼	.08½
precip, bbls .....lb.	...	.12	...	.12	...	.12
Manganese Borate, 30%, 200						
lb bbls .....lb.	.15	.16	.15	.16	.15	.16
Chloride, 600 lb cks ....lb.	.09	.12	.09	.12	.09	.12
Dioxide, tech (peroxide),						
paper bgs, c-l .....ton	...	47.50	...	47.50	45.00	50.00
Sulfate, tech, anhyd, 90-						
95%, 550 lb drs.....lb.	...	.07¼	...	...	...	...
Mangrove, 55%, 400 lb bbls lb.	...	.04	...	.04	...	.04
Bark, African .....ton	26.50	27.00	25.50	27.00	26.00	30.00
Mannitol, pure cryst, cs,						
wks .....lb.	...	1.48	1.48	1.60	...	...
Marble Flour, blk .....ton	12.00	13.00	12.00	13.00	12.00	13.00
Mercuric chloride .....lb.	...	1.20	.81	1.20	.71	.93
Mercury metal ...76 lb. flasks	93.00	95.00	73.50	95.00	69.00	77.00
Meta-nitro-aniline .....lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-paratoluidine 200						
lb bbls .....lb.	1.45	1.55	1.40	1.55	1.40	1.55

		Current Market	1936 Low	1936 High	1935 Low	1935 High
Meta-phenylene-diamine 300 lb bbls	lb.	.80	.84	.80	.84	.80	.84
Peroxide, 100 lb cs	lb.	1.20	1.25	1.20	1.25	1.20	1.25
Silicofluoride, bbls	lb.	.09	.10	.09	.10	.09	.10
Stearate, bbls	lb.	.19	.20	.19	.20	.19	.20
Meta-toluene-diamine, 300 lb bbls	lb.	.65	.67	.65	.69	.67	.69
Methanol, 95%, frt allowed, drs	gal. *o*	.37½	.58	.37½	.58	.37½	.58
tks, frt allowed	gal. *o*	.33	.36½	.33	.36½	.33	.36½
97% frt allowed, drs gal.	*o*	.38½	.59	.38½	.59	.38½	.59
tks, frt allowed	gal. *o*	.34	.37½	.34	.37½	.34	.37½
Pure, frt allowed, drs gal.	*o*	.40	.61	.40	.61	.40	.61
tks, frt allowed	gal. *o*	.35½	.39	.35½	.39	.35½	.39
Synthetic, frt allowed, drs	gal. *o*	.40	.61	.40	.61	.40	.61
tks, frt allowed	gal. *o*	.35½	.39	.35½	.39	.35½	.39
Methyl Acetate, dom, 98-100%, drs	lb.	.16	.17½	.11	.18½	.18	.18½
Synthetic, 410 lb drs	lb.	.16	.17	.16	.17	.16	.17
tks	lb.	...	.15	...	.15	...	.15
Acetone, frt allowed, drs	gal. *p*	.45½	.58½	.45½	.68½	.49½	.73½
tks, frt allowed, drs gal.	*p*	.41	.44½	.41	.48	.44	.52½
Synthetic, frt allowed, east of Rocky M., drs gal.	*p*	.52½	.59½	.52½	.60	.57½	.60
tks, frt allowed	gal.	.48	.49½	.48	.53	...	.53
West of Rocky M., frt allowed, drs	gal. *p*	.55½	.58	.55½	.69	.66	.69
tks, frt allowed	gal. *p*	...	.51	.51	.63½	...	.63½
Hexyl Ketone, pure, drs	lb.	...	.60	...	.60	...	.60
Anthraquinone	lb.	.65	.67	.65	.67	.65	.67
Butyl Ketone, tks	lb.	...	.10½	...	.10½	...	.10½
Chloride, 90 lb cyl	lb.	...	.45	...	.45	...	.45
Ethyl Ketone, tks	lb.	...	.07½	...	.07½	...	.07½
Propyl carbinol, drs	lb.	.60	.75	.60	.75	.60	.75
Mica, dry grd, bgs, wks	lb.	35.00	...	35.00	...	35.00	...
Michler's Ketone, kgs	lb.	...	2.50	...	2.50	...	2.50
Molasses, blackstrap, tks, f.o.b. NY	gal.	...	.07¼	.07	.08¼	.07¾	.08¼
Monoamylamine, drs, wks	lb.	...	1.00	...	1.00	...	1.00
Monochlorobenzene, see Chlorobenzene, mono.							
Monoethanolamine, tks, wks	lb.	...	.30	...	.30	...	...
Monomethylparaminosulfate, 100 lb drs	lb.	3.75	4.00	3.75	4.00	3.75	4.00
Myrobalans 25%, liq bbls.	lb.	...	.04¼	...	.04¼	...	.04¼
50% Solid, 50 lb boxes	lb.	.06	.06¼	.06	.06¼	.06	.06¼
J1 bgs	ton	...	26.50	22.00	26.50	23.50	27.00
J2 bgs	ton	...	16.75	14.25	16.75	15.00	15.75
R2 bgs	ton	...	16.25	14.00	16.25	16.00	16.50
Naphtha, v.m.&p. (deodorized) see petroleum solvents.							
Naphtha, Solvent, water-white, tks	gal.	...	.31	...	.31	.26	.30
drs, c-l	gal.	...	.36	...	.36	.31	.35
Naphthalene, dom, crude, bgs, wks	lb.	...	2.75	2.75	4.50	1.65	3.00
Imported, cif, bgs	lb.	...	nom.	...	...	1.90	3.00
Dyestuffs, bgs, bbls, Eastern wks	lb.	.06	.07	.06	.07	.04¼	.07
Balls, flakes, pks	lb.	...	.08	.07¼	.08	...	...
Balls, ref'd, bbls, Eastern wks	lb.	...	.07¼	.06¾	.07¼	.04½	.06¾
Flakes, ref'd, bbls, Eastern wks	lb.	...	.07¼	.06¾	.07¼	.04½	.06¾
Dyestuffs, bgs, bbls, Mid-West wks	lb. *q*	.06½	.07½	.06½	.07½	.04¾	.07½
Balls, ref'd, bbls, Mid-West wks	lb. *q*	...	.07¾	.07¼	.07¾	.05	.07½
Flakes, ref'd, bbls, Mid-West wks	lb. *q*	...	.07¾	.07¼	.07¾	.05	.07¼
Nickel Carbonate, bbls.	lb.	...	.36	...	.36	.35	.36
Chloride, bbls	lb.	.18	.19	.18	.19	.18	.19
Oxide, 100 lb kgs, NY.	lb	.35	.37	.35	.37	.35	.37
Salt, 400 lb bbls, NY	lb.	.13	.13½	.13	.13½	.12½	.13½
Single, 400 lb bbls, NY	lb.	.13	.13½	.13	.13½	.11½	.13½
Metal ingot	lb.	...	.35	...	.35	...	.35
Nicotine, free 50%, 8 lb tins, cases	lb.	8.25	10.15	8.25	10.15	8.25	10.15
Sulfate, 55 lb drs	lb.	.75	1.17	.75	1.17	.67	.80
Nitre Cake, blk	ton	12.00	14.00	12.00	14.00	12.00	14.00
Nitrobenzene, redistilled, 1000 lb drs, wks	lb.	.08	.10	.08	.11	.09	.11
tks	lb.	...	.08½	...	.08½	...	.08½
Nitrocellulose, c-l-l c-l, wks	lb.	.26	.29	.26	.34	.27	.34
Nitrogenous Mat'l, bgs, imp	unit	...	3.10	2.00	3.10	2.20	2.75
dom, Eastern wks	unit	...	3.00	1.90	3.00	2.20	2.40
dom, Western wks	unit	...	2.75	1.85	2.75	1.90	2.30
Nitronaphthalene, 550 lb bbls	lb.	.24	.25	.24	.25	.24	.25
Nutgalls Aleppy, bgs	lb.	.16	.18	.16	.18	.12	.18
Chinese, bgs	lb.	.19	.20	.19	.20	.19	.20
Oak Bark Extract, 25%, bbls	lb.	...	.03½	...	.03½	...	.03½
tks	lb.	...	.02¾	...	.02¾	...	.02¾
Octyl Acetate, tks, wks	lb.	...	.15	...	.15	...	...
Orange-Mineral, 1100 lb cks NY	lb.	...	.11¼	.10	.11¼	.09¼	.10½
Orthoaminophenol, 50 lb kgs.	lb.	2.15	2.25	2.15	2.25	2.15	2.25
Orthoanisidine, 100 lb drs	lb.	.82	.84	.82	.84	.82	.84
Orthochlorophenol, drs	lb.	.50	.65	.50	.65	.50	.65
Orthocresol, drs	lb.	.13	.15	.13	.15	.13	.15
Orthodichlorobenzene, 1000 lb drs	lb.	.05	.06	.05	.11½	.05½	.06

o Country is divided in 5 zones, prices varying by zone. In drum prices range covers both zone and c-l and lcl quantities in the 5 zones; in each case, bbl. prices are 2½c higher; synthetic is not shipped in bbls.; *p* Country is divided into 5 zones. Also see footnote directly above; *q* Naphthalene quoted on Pacific Coast F.A.S. Phila. or N. Y.

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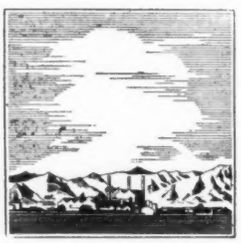

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Orthonitrochlorobenzene
Phloroglucinol

Prices

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Orthonitrochlorobenzene, 1200 lb drs, wks ..... lb.	.28	.29	.28	.29	.28	.29
Orthonitrotoluene, 1000 lb drs, wks ..... lb.	.07	.10	.07	.10	.05½	.10
Orthonitrophenol, 350 lb drs ..... lb.	.52	.80	.52	.80	.52	.80
Orthotoluidine, 350 lb bbls, l-c-l ..... lb.	.14	.15	.14	.15	.14½	.15
Orthonitroparachlorphenol, tins ..... lb.	.70	.75	.70	.75	.70	.75
Osage Orange, cryst ..... lb.	.17	.25	.17	.25	.17	.25
51 deg liquid ..... lb.	.07	.07¾	.07	.07¾	.07	.07¾
Powd, 100 lb bgs ..... lb.	.14½	.15	.14½	.15	.14½	.15
Paraffin, rfd, 200 lb cs slabs 122-127 deg M P ..... lb.	.0445	.04½	.0445	.04½	.04	.04¾
128-132 deg M P ..... lb.	.04¾	.049	.04¾	.049	.05	.0515
133-137 deg M P ..... lb.	.05½	.05¾	.05½	.05¾	.0575	.06
Para aldehyde, 110-55 gal drs ..... lb.	.16	.18	.16	.18	.16	.18
Aminoacetanilid, 100 lb kgs ..... lb.	...	.85	...	.85	...	.85
Aminohydrochloride, 100 lb kgs ..... lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kgs lb.	...	1.05	...	1.05	...	1.05
Chlorophenol, drs ..... lb.	.50	.65	.50	.65	.50	.65
Coumarone, 330 lb drs .. lb.	...	...	...	...	...	...
Cymene, refd, 110 gal dr ..... gal.	2.25	2.50	2.25	2.50	2.25	2.50
Dichlorobenzene, 200 lb bbls wks ..... lb.	.16	.20	.16	.20	.16	.20
Formaldehyde, bbls, wks lb.	.34	.35	.34	.39	.38	.39
Nitroacetanilid, 300 lb bbls ..... lb.	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls, wks ..... lb.	.47	.51	.47	.51	.48	.55
Nitrochlorobenzene, 1200 lb drs, wks ..... lb.	.23½	.24	.23½	.24	.23½	.24
Nitro-orthotoluidine, 300 lb bbls ..... lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol, 185 lb bbls lb.	.45	.50	.45	.50	.45	.50
Nitrosodimethylaniline, 120 lb bbls ..... lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls lb.	.36	.37	.36	.37	.35	.37
Phenylenedamine, 350 lb bbls ..... lb.	1.25	1.30	1.25	1.30	1.25	1.30
Para Tertiary amyl phenol, wks, drs, c-l ..... lb.	...	.26	.26	.50	.32	.50
Toluenesulfonamide, 175 lb bbls ..... lb.	.70	.75	.70	.75	.70	.75
tks, wks ..... lb.	...	.31	...	.31	...	.31
Toluenesulfonchloride, 410 lb bbls, wks ..... lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls, wks ..... lb.	.56	.58	.56	.60	.56	.60
Paris Green, Arsenic Basis 100 lb kgs ..... lb.	...	.24	...	.24	...	.24
250 lb kgs ..... lb.	...	.22	...	.22	...	.22
Perchlorethylene, 100 lb drs, frt allowed ..... lb.	...	.10½	.10½	.15	...	.15
Persian Berry Ext, bbls .. lb.	.55	Nom.	.55	Nom.	.55	Nom.
Pentane, normal, 28-38°C, group 3, tks..... gal.	...	.09½	.09	.09½	...	.09
drs, group 3 ..... gal.	.12½	.16	.10	.16	.10	.15
Petrolatum, dark amber, bbls ..... lb.	.02⅝	.02⅞	.02⅝	.02⅞	.02	.02⅞
Light, bbls ..... lb.	.03⅛	.03⅜	.03⅛	.03⅜	.02½	.03⅛
Medium, bbls ..... lb.	.02⅞	.03⅛	.02⅞	.03⅛	.02¼	.03⅛
Dark green, bbls ..... lb.	.02½	.02¾	.02½	.02¾	.02½	.02¾
White, lily, bbls ..... lb.	.06	.06¼	.06	.06¼	.05¼	.06½
White, snow, bbls ..... lb.	.07	.07¼	.07	.07¼	.06¼	.07½
Red, bbls ..... lb.	.02⅝	.02⅞	.02⅝	.02⅞	.02¼	.02⅞
Petroleum Ether, 30-60°, group 3, tks ..... gal.	...	.13	...	.13	...	.13
drs, group 3 ..... gal.	.15	.16	.15	.16	.15	.16

PETROLEUM SOLVENTS AND DILUENTS

Cleaners naphthas, group 3, tks, wks ..... gal.	.07⅜	.07½	.07⅜	.07½	.06⅞	.07¼
Bayonne, tks, wks .. gal.	...	.09½	.09	.09½	...	.09
West Coast, tks .... gal.	...	.15	...	.15	...	.15
Hydrogenated, naphthas, frt allowed East, tks .... gal.	...	.16	.15	.16	.15	.17½
No. 2, tks ..... gal.	...	.18	...	.18	.18	.22½
No. 3, tks ..... gal.	...	.15	...	.15	.15	.17½
No. 4, tks ..... gal.	...	.18	...	.18	.18	.22½
Lacquer diluents, tks Bayonne ..... gal.	.12	.12½	.12	.12½	.12	.12½
Group 3, tks ..... gal.	.07⅞	.08½	.07⅞	.08½	.07⅞	.08
Naphtha, V.M.P., East, tks, wks ..... gal.	...	.10	.09	.10	...	.09
Group 3, tks, wks ... gal.	.07⅜	.07½	.07⅜	.07½	.06⅞	.07¼
Petroleum thinner, East, tks, wks ..... gal.	...	.09	.09	.09½	...	.09
Group 3, tks, wks ... gal.	.06⅜	.06⅝	.06⅜	.06⅝	.05⅞	.06¼
Rubber Solvents, stand grd, East, tks, wks ..... gal.	...	.09½	.09	.09½	...	.09
Group 3, tks, wks .. gal.	.07⅜	.07½	.07⅜	.07½	.06⅞	.07¼
Stoddard Solvent, East, tks, wks ..... gal.	...	.09½	.09	.09½	...	.09
Group 3, tks, wks ... gal.	.06⅞	.07	.06⅞	.07	.06⅜	.07
Phenol, 250-100 lb drs .... lb.	.13¼	.15	.13¼	.15	.14¼	.15
Phenyl-Alpha-Naphthylamine, 100 lb kgs ..... lb.	...	1.35	...	1.35	...	1.35
Phenyl Chloride, drs ..... lb.	...	.16	...	.16	...	.16
Phenylhydrazine Hydrochloride ..... lb.	2.90	3.00	2.90	3.00	2.90	3.00
Phloroglucinol, tech, tins .. lb.	15.00	16.50	15.00	16.50	15.00	16.50
CP, tins ..... lb.	20.00	22.00	20.00	22.00	20.00	22.00

Current — Phosphate Rock, Rosin Oil

	Current Market	1936 Low	1936 High	1935 Low	1935 High
Phosphate Rock, f.o.b. mines					
Florida Pebble, 68% basis ton	...	1.85	...	1.85	1.85	3.40
70% basis .. ..ton	...	2.35	...	2.35	2.35	3.90
72% basis .....ton	...	2.85	...	2.85	2.85	4.40
75-74% basis .....ton	...	3.85	...	3.85	3.85	5.40
75% basis .....ton	...	4.35	...	4.35	4.35	5.50
Tennessee, 72% basis ..ton	...	4.50	...	4.50	4.50	4.75
Phosphorus Oxychloride 175 lb cyl .. ..lb.	.16	.20	.16	.20	.16	.20
Red, 110 lb cases .....lb.	.40	.44	.40	.45	.44	.45
Yellow, 110 lb cs, wks..lb.	.28	.33	.28	.33	.28	.33
Sesquisulfide, 100 lb cs..lb.	.38	.44	.38	.44	.38	.44
Trichloride, cyl .....lb.	.16	.20	.16	.20	.16	.20
Phthalic Anhydride, 100 lb drs, wks .....lb.	.14½	.15½	.14½	.15½	.14½	.15½
Pine Oil, 55 gal drs or bbls						
Destructive dist .....lb.	...	.50	.44	.50	.44	.50
Steam dist wat wh bbls gal.	.64	.65	.64	.65	.64	.65
tks .....gal.	...	.59	...	.59	...	.59
Straw color, bbls .....gal.	...	.59	...	.59	...	.59
tks .....gal.	...	.54	...	.54	...	.54
Pitch Hardwood, wks ....ton	...	15.00	...	15.00	15.00	20.00
Burgundy, dom, bbls, wks lb.	...	.03½	...	.03½	...	.03½
Imported .....lb.	.11	.13	.11	.13	.11	.13
Coaltar, bbls, wks .....ton	...	19.00	...	19.00	...	19.00
Petroleum, see Asphaltum in Gums' Section.						
Pine, bbls .....bbl.	5.00	5.25	4.00	5.25	3.75	4.25
Stearin, drs .....lb.	.03	.04½	.03	.04½	.03	.04½
Platinum, refd .....oz.	45.00	48.00	34.50	64.00	35.00	38.00
POTASH						
Potash, Caustic, wks, sol..lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
flake .....lb.	.07	.07⅛	.07	.07⅛	.07	.07⅛
Liquid, tks .....lb.	...	.02⅞	...	.02⅞	...	.02⅞
Manure Salts, imported						
20% basis, blk .....ton	...	12.00	11.00	12.00	8.60	11.00
30% basis, blk .....ton	...	16.50	14.40	16.50	12.90	14.40
Potassium Acetate .....lb.	.26	.28	.26	.28	.26	.28
Potassium Muriate, 80% basis bgs .....ton	...	25.00	22.50	25.00	22.00	22.50
Dom, blk .....unit	...	.50	.45	.50	.40	.45
Pot & Mag Sulfate, 48% basis bgs .....ton	...	24.75	22.25	24.75	19.50	22.50
Potassium Sulfate, 90% basis bgs .....ton	...	36.25	33.75	36.25	33.75	35.00
Potassium Bicarbonate, USP 320 lb bbls .....lb.	.09	.18	.09	.18	.07½	.09
Bichromate Crystals, 725 lb cks* .....lb.	.08½	.09	.08½	.09	.08⅛	.09
Binoxalate, 300 lb bbls..lb.	...	.23	...	.23	.22	.23
Bisulfate, 100 lb kgs ...lb.	.15½	.18	.15½	.18	.35	.36
Carbonate, 80-85% calc 800 lb cks .....lb.	.06½	.07	.06½	.07½	.07½	.07⅞
liquid, tks .....lb.	...	.02¾	.02¾	.02⅞	...	...
drs, wks .....lb.	.02⅞	.03½	.02⅞	.03¼	...	...
Chlorate crys, 112 lb kgs, wks .....lb.	.09¼	.09½	.09¼	.09½	...	.09¾
gran, kgs .....lb.	.12	.13	.12	.13	.12	.13
powd, kgs .....lb.	.08	.08¼	.08	.08¼	.08¼	.09¼
Chloride, crys, bbls ....lb.	.04	.04¼	.04	.04¼	.04	.04¾
Chromate, kgs .....lb.	.23	.28	.23	.28	.23	.28
Cyanide, 110 lb cases ..lb.	.55	.57½	.55	.57½	.55	.57½
Iodide, 75 lb bbls .....lb.	1.10	1.15	1.10	1.25	1.25	1.40
Metabisulfite, 300 lb bbls lb.	...	.15	.13¾	.15	...	.15
Oxalate, bbls .....lb.	.25	.26	.25	.26	.16	.24
Perchlorate, cks, wks ...lb.	.09	.11	.09	.11	.09	.11
Permanganate, USP, crys, 500 & 1000 lb drs, wks lb.	.18½	.19½	.18½	.19½	.18½	.19½
Prussiate, red, 112 lb kgs lb.	.35	.38½	.35	.38½	.35	.38½
Yellow, 500 lb casks.. lb.	.16	.18	.16	.19	.18	.19
Tartrate Neut, 100 lb kgs lb.	...	.21	...	.21	...	.21
Titanium Oxalate, 200 lb bbls .....lb.	.32	.35	.32	.35	.32	.35
Propane, group 3, tks ....lb.	.03	.04⅜	.03	.04⅜	...	.07
Pumice Stone, lump bgs ..lb.	.04½	.06	.04½	.06	.04½	.06
250 lb bbls .....lb.	.05	.07	.05	.07	.05	.07
Powd, 350 lb bgs .....lb.	.02½	.03	.02½	.03	.02½	.03
Putty, coml, tubs .....100 lb.	...	3.00	2.75	3.00	...	2.75
Linseed Oil, kgs ...100 lb.	...	4.75	4.50	4.75	...	4.50
Pyrethrum, conc liq: 2.4% pyretherins, drs, frt allowed .....gal.	4.25	4.60	...	...	...	...
3.6% pyretherins, drs, frt allowed .....gal.	6.25	6.00	...	...	...	...
Flowers, coarse, Japan, bgs .....lb.	...	.11½	...	...	...	...
Fine powd, bbls.....lb.	...	.14	...	...	...	...
Pyridine, 50 gal drs .....gal.	...	1.30	...	1.30	1.20	1.30
Pyrites, Spanish cif Atlantic ports, blk ... .unit	.12	.13	.12	.13	.12	.13
Pyrocatechin, CP, drs, tins lb.	2.15	2.75	2.15	2.75	2.40	3.00
Quebracho, 35% liq tks ...lb.	...	.02⅞	.02⅝	.02⅞	...	.02⅝
450 lb bbls, c-l .....lb.	...	.03¾	.03⅛	.03¾	...	.03⅛
Solid, 63%, 100 lb bales cif .....lb.	...	.03⅞	.03⅝	.03⅞	...	.03⅝
Clarified, 64%, bales..lb.	...	.04⅜	.03⅞	.04⅜	...	.03⅞
Quercitron, 51 deg liq, 450 lb bbls .....lb.	.06	.06½	.06	.06½	.06	.06½
Solid, 100 lb boxes .....lb.	.10	.12	.10	.12	.10	.12
R Salt, 250 lb bbls, wks ..lb.	.52	.57	.52	.57	.44	.45
Resorcinol tech, cans .....lb.	.75	.80	.75	.80	.75	.80
Rochelle Salt, cryst .....lb.	.14½	.15	.14	.15	.14	.15
Powd, bbls .....lb.	.13½	.14	.13	.14	.13	.13½
Rosin Oil, bbls, first run gal.	.69	.71	.38	.71	.36	.45
Second run .....gal.	.71	.73	.43	.73	.43	.48
Third run, drs .....gal.	.75	.77	.49	.77	.50	.60

* Spot price is ⅛c higher.

SUNSHINE STATE POTASH
A PRODUCT OF NEW MEXICO U.S.A.
REG. U. S. PAT. OFF.
MURIATE OF POTASH
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MANURE SALTS
APPROXIMATELY 30% K_2O
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Naphthenic Acid Sludge

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$C_8H_{17}OH$ - B. P. 178°C. - WATER WHITE

Sebacic Acid
C-10 DIBASIC ACID FOR RESINS AND PLASTICIZERS
Prompt Shipment Drums—Carloads—Tanks

ACETAMIDE
Manufacturer Synthetic Organic Chemicals
AMERICAN CHEMICAL PRODUCTS CO.
Rochester, N. Y.

		Current Market	1936 Low	1936 High	1935 Low	1935 High
Rosins 600 lb bbls, 280 lb unit ex. yard NY:						
B	...	10.95	4.45	10.95	4.65	5.65
D	...	10.95	4.95	10.95	5.02½	5.75
E	...	10.95	5.15	10.95	5.15	5.90
F	...	10.95	5.40	10.95	5.20	5.95
G	...	10.95	5.50	10.95	5.25	6.00
H	...	10.95	5.60	10.95	5.25	6.00
I	...	10.95	5.70	10.95	5.25	6.00
K	...	10.95	5.55	10.95	5.27½	6.05
M	...	10.95	5.60	10.95	5.35	6.10
N	...	11.00	5.70	11.00	5.75	6.40
WG	...	11.00	5.85	11.00	5.95	6.87½
WW	...	12.05	5.90	12.05	6.25	7.55
Rosins, Gum, Savannah (280 lb unit):						
B	...	9.70	3.15	9.70	3.40	4.40
D	...	9.70	3.75	9.70	3.70	4.50
E	...	9.70	3.90	9.70	3.90	4.65
F	...	9.70	4.10	9.70	3.95	4.70
G	...	9.70	4.20	9.70	4.00	4.75
H	...	9.70	4.30	9.70	4.00	4.75
I	...	9.70	4.35	9.70	4.00	4.75
K	...	9.70	4.30	9.70	4.02½	4.80
M	...	9.70	4.35	9.70	4.10	4.85
N	...	9.75	4.45	9.75	4.50	5.15
WG	...	9.75	4.45	9.75	4.70	5.60
WW	...	10.80	4.55	10.80	5.15	6.25
X	...	10.80	4.55	10.80	5.20	6.25
Rosins, Wood, wks (280 lb unit), wks, FF	...	9.80	4.30	9.80	4.05	6.35
K	...	10.40	4.45	10.40	4.30	7.00
M	...	10.60	4.55	10.60	4.55	7.25
N	...	11.10	4.95	11.10	5.00	7.75
Rosin, Wood. c-l, FF grade, NY	...	10.52	6.10	10.52	4.92	5.62
Rotten Stone, bgs mines..ton	...	35.00	...	35.00	23.50	35.00
Lump, imported, bbls ...lb.	.05	.07	.05	.07	.05	.07
Selected, bbls. .....lb.	.08	.10	.08	.10	.08	.10
Powdered, bbls .....lb.	.02½	.05	.02½	.05	.02½	.05
Sago Flour, 150 lb bgs ....lb.	.02¾	.03¾	.02¾	.03¾	.02¾	.03¾
Sal Soda, bbls, wks ...100 lb.	...	1.15	1.15	1.30	...	1.30
Salt Cake, 94-96%, c-l, wks ton	19.00	23.00	19.00	23.00	13.00	18.00
Chrome, c-l, wks .....ton	12.00	13.00	11.00	13.00	12.00	13.00
Saltpetre, double refd, gran, 450-500 lb bbls .....lb.	.059	.06¼	.059	.06¼	.059	.06¼
Powd, bbls .....lb.	.069	.07⅞	.069	.07⅞	.069	.07⅞
Cryst, bbls .....lb.	.069	.08	.069	.08	.069	.08
Satin, White, 550 lb bbls..lb.	...	.01½	..	.01½	...	.01½
Shellac, Bone dry, bbls..lb. *r*	.19½	.21	.17½	.26½	.19	.32
Garnet, bgs .....lb.	.16	.17	.16	.20	.17	.27
Superfine, bgs .....lb. *s*	.15	.18½	.14½	.18½	.16	.28
T. N., bgs .....lb. *s*	.14	.14½	.13½	.16	.13	.25
Schaeffer's Salt, kgs .....lb.	.46	.48	.46	.50	.48	.50
Silver Nitrate, vials .....oz.	...	.33	.32⅜	.34⅜	.36⅜	.53¾
Slate Flour, bgs, wks ....ton	9.00	10.00	9.00	10.00	9.00	10.00
Soda Ash, 58% dense, bgs, c-l, wks .....100 lb.	...	1.25	...	1.25	...	1.25
58% light, bgs .....100 lb.	...	1.23	...	1.23	...	1.23
blk .....100 lb.	...	1.05	...	1.05	...	1.05
paper bgs .....100 lb.	...	1.20	...	1.20	...	1.20
bbls .....100 lb.	...	1.50	...	1.50	...	1.50
Soda Caustic, 76% grnd & flake, drs .....100 lb.	...	3.00	...	3.00	...	3.00
76% solid, drs .....100 lb.	...	2.60	...	2.60	...	2.60
Liquid sellers, tks, 100 lbs.	...	2.25	...	2.25	...	2.25
Sodium Abietate, drs .....lb.	...	.08	...	.08	...	.08
Acetate, tech, 450 lb bbls, wks .....lb.	.04½	.05	.04½	.05	.04½	.05
Alignate, drs .....lb.	...	.64	...	.64	...	.64
Antimoniate, bbls .....lb.	.12	.12½	.12	.14	...	...
Arsenate, drs .....lb.	...	.10½	...	.10½	...	.10½
Arsenite, liq, drs .....gal.	.40	.75	.40	.75	.40	.75
Benzoate, USP, kgs ....lb.	.46	.48	.46	.48	.46	.48
Bicarb, 400 lb bbl, wks 100 lb.	...	1.75	1.75	1.85	...	1.85
Bichromate, 500 lb cks, wks* .....lb.	.06½	.07	.06½	.07	.06½	.07
Bisulfite, 500 lb bbl, wks lb.	.03¼	.036	.03¼	.036	.03¼	.036
35-40% sol cbys, wks 100 lb.	1.95	2.10	1.95	2.10	1.95	2.10
Chlorate, bgs, wks .....lb.	.06¼	.07½	.06¼	.07½	.06¼	.07½
Chloride, tech .....ton	13.60	16.50	13.60	16.50	13.60	16.50
Cyanide, 96-98%, 100 & 250 lb drs, wks .....lb.	.15½	.17½	.15½	.17½	.15½	.17½
Fluoride, 90%, 300 lb bbls, wks .....lb.	.07½	.08¼	.07¼	.08¼	.07¼	.08¼
Hydrosulfite, 200 lb bbls, f.o.b. wks .....lb.	.17	.18	.17	.19	.18	.21
Hyposulfite, tech, pea crys 375 lb bbls, wks 100 lb.	2.50	3.00	2.50	3.00	2.50	3.00
Tech, reg cryst, 375 lb bbls, wks .....100 lb.	2.40	2.75	2.40	2.75	2.40	2.75
Iodide .....lb.	1.90	1.95	1.90	2.05	2.00	2.40
Metal, drs, 280 lbs .....lb.	...	.19	...	...	...	...
Metanilate, 150 lb bbls..lb.	.41	.42	.41	.42	.41	.42
Metasilicate, gran, c-l, wks .....100 lb.	...	2.15	2.15	3.00	2.65	3.05
cryst, bbls, c-l, wks 100 lb.	...	2.75	2.75	3.25	...	3.25
Monohydrate, bbls .....lb.	...	.023	...	.023	...	.02½
Napthenate, drs .....lb.	...	.09	...	.09	...	.09
Naphthionate, 300 lb bbl lb.	.52	.54	.52	.54	.52	.54
Nitrate, 92%, crude, 200 lb bgs, c-l, NY .....ton	...	26.80	24.80	26.80	...	24.80
100 lb bgs .....ton	...	27.50	25.50	27.50	...	25.50
Bulk .....ton	...	25.50	23.50	25.50	...	23.50

r Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 3c; Philadelphia deliveries f.o.b. N. Y.; refined 6c higher in each case; *s* T. N. and Superfine prices quoted f.o.b. N. Y. and Boston; Chicago prices 1c higher; Pacific Coast 3c; Philadelphia f.o.b. N. Y. * Spot price is ⅛c higher.

	Current Market	1936 Low	1936 High	1935 Low	1935 High
Sodium (continued):					
Nitrite, 500 lb bbls .....lb.	.07	.10	.07	.08	.07¼ .08
Orthochlorotoluene, sulfonate, 175 lb bbls, wks..lb.	.25	.27	.25	.27	.25 .27
Perborate, drs, 400 lbs..lb.	.14¾	.15¼	.14¾	.18	.17 .19
Peroxide, bbls, 400 lb ..lb.	...	.17	...	.17	... .17
Phosphate, di-sodium, tech, 310 lb bbls, wks 100 lb.	...	1.90	1.95	2.30	2.20 2.30
bgs, wks .....100 lb.	...	1.70	1.75	2.10	2.00 2.10
tri-sodium, tech, 325 lb bbls, wks .....100 lb.	...	2.05	1.95	2.30	2.30 2.70
bgs, wks .....100 lb.	...	1.85	1.75	2.10	2.10 2.60
Picramate, 160 lb kgs ..lb.	.65	.67	.65	.69	.67 .69
Prussiate, Yellow, 350 lb bbl, wks .....lb.	.10	.11½	.10	.12	.11½ .12
Pyrophosphate, anhyd, 100 lb bbls .....lb.	...	.10	.10	.132	.102 .15
Silicate, 60°, 55 gal drs, wks .....100 lb.	1.65	1.70	1.65	1.70	1.65 1.70
40°, 35 gal drs, wks 100 lb.	...	.80	...	.80	... .80
tks, wks .....100 lb.	...	.65	...	.65	... .65
Silicofluoride, 450 lb bbls NY .....lb.	.06½	.07	.05¼	.07¼	.04¼ .05
Stannate, 100 lb drs ....lb.	.34½	.37½	.28½	.37½	.31 .38
Stearate, bbls .....lb.	.20	nom.	.20	.26	.20 .25
Sulfanilate, 400 lb bbls..lb.	.16	.18	.16	.18	.16 .18
Sulfate Anhyd, 550 lb bgs* c-l, wks .....100 lb. ‡	1.45	1.90	1.30	1.90	1.25 2.35
Sulfide, 80% cryst, 440 lb bbls, wks .....lb.	...	.02¼	...	.02¼	... .02¼
62% solid, 650 lb drs, c-l, wks .....lb.	...	.03	...	.03	... .03
Sulfite, cryst, 400 lb bbls, wks .....lb.	.023	.02½	.023	.02½	.023 .02½
Sulfocyanide, bbls .....lb.	.28	.47	.28	.47	.32 .42½
Sulforicinoleate, bbls ...lb.	...	.12	...	...	... ...
Tungstate, tech, crys, kgs lb.	.85	.90	.85	.90	... .90
Sorbitol, com., drs, basis content, wks .....lb.	...	.25	...	...	... ...
Spruce Extract, ord, tks...lb.	...	.01	...	.01	... .01
Ordinary, bbls .....lb.	...	.01½	...	.01½	... .01½
Super spruce ext, tks....lb.	...	.01⅝	...	.01⅝	... .01⅝
Super spruce ext, bbls...lb.	...	.01⅞	...	.01⅞	... .01⅞
Super spruce ext, powd, bgs .....lb.	...	.04	..	.04	... .04
Starch, Pearl, 140 lb bgs 100 lb.	3.80	4.00	2.99	4.30	3.13 3.78
Powd, 140 lb bgs....100 lb.	2.90	4.10	3.90	4.54	3.23 3.66
Potato, 200 lb bgs.....lb.	.04½	.05½	.04½	.05½	.04½ .06
Imp, bgs .....lb.	.05	.06	.05	.06	.05¾ .06½
Rice, 200 lb bbls .....lb.	...	.07¼	...	.07¼	.07¼ .08½
Wheat, thick, bgs .....lb.	.08¼	.08½	.08¼	.08½	... .08¼
Strontium carbonate, 600 lb bbls, wks .....lb.	.07¼	.07½	.07¼	.07½	.07¼ .07½
Nitrate, 600 lb bbls, NY lb.	.08¾	.09½	.08¾	.09½	.08¾ .09½
Sucrose octa-acetate, den, grd, bbls, wks .....lb.	.45	...	.45	...	... ...
tech, bbls, wks .....lb.	.40	...	.40	...	... ...
Sulfur	...	...	...	...	... ...
Crude, f.o.b. mines ....ton	18.00	19.00	18.00	19.00	18.00 19.00
Flour, coml, bgs ....100 lb.	1.60	2.35	1.60	2.35	1.60 2.35
bbls .....100 lb.	1.95	2.70	1.95	2.70	1.95 2.70
Rubbermakers, bgs ..100 lb.	2.20	2.80	2.20	2.80	2.20 2.80
bbls .....100 lb.	2.55	3.15	2.55	3.15	2.55 3.15
Extra fine, bgs .....100 lb.	2.40	3.00	2.40	3.00	2.40 3.00
Superfine, bgs .....100 lb.	2.20	2.80	2.20	2.80	2.20 2.80
bbls .....100 lb.	2.25	3.10	2.25	3.10	2.25 3.10
Flowers, bgs .....100 lb.	3.00	3.75	3.00	3.75	3.00 3.75
bbls .....100 lb.	3.35	4.10	3.35	4.10	3.35 4.10
Roll, bgs .....100 lb.	2.35	3.10	2.35	3.10	2.35 3.10
bbls .....100 lb.	2.50	3.25	2.50	3.25	2.50 3.25
Sulfur Chloride, red, 700 lb drs, wks .....lb.	.05	.05½	.05	.05½	.05 .05½
Yellow, 700 lb drs, wks lb.	.03½	.04½	.03½	.04½	.03½ .04½
Sulfur Dioxide, 150 lb cyl lb.	.06½	.08½	.06½	.08½	.08½ .10
Multiple units, wks ....lb.	.05½	.06	.05½	.06	... .06½
tks, wks .....lb.	.04½	.04¾	.04½	.04¾	... .04¾
Refrigeration, cyl, wks ...lb.	.10	.13	.10	.13	... .13
Multiple units, wks .....lb.	.07	.09¼	.07	.09¼	... .09¼
Sulfuryl Chloride .....lb.	.15	.40	.15	.40	.15 .40
Sumac, Italian, grd .....ton		59.00	52.00	60.00	50.00 65.00
Extract, 42°, bbls .....lb.	.04½	.16½	...	...	... ...
Superphosphate, 16% bulk, wks .....ton	...	4.00	2.40	4.00	8.25 8.50
Run of pile .....ton	...	nom.	2.70	3.90	7.75 8.00
Triple, 44-45%, a. p. a. bulk, wks Balt. unit ton	...	.70	...	...	... ...
Talc, Crude, 100 lb bgs, NY ton	13.00	15.00	13.00	15.00	14.00 15.00
Refd, 100 lb bgs, NY ton	14.00	16.00	14.00	18.00	16.00 18.00
French, 220 lb bgs, NY ton	23.00	30.00	22.00	30.00	22.00 30.00
Refd, white, bgs .....ton	45.00	60.00	45.00	60.00	45.00 60.00
Italian, 220 lb bgs to arr ton	60.00	62.00	60.00	75.00	70.00 75.00
Refd, white, bgs, NY ton	65.00	70.00	65.00	80.00	75.00 80.00
Tankage Grd, NY ....unit u	...	4.25	2.65	4.25	2.35 3.00
Ungrd .....unit u	...	4.25	2.40	4.25	2.15 2.50
Fert grade, f.o.b. Chicago .....unit u	...	4.00	2.40	4.00	2.25 2.65
South American cif..unit u	...	nom.	2.70	3.90	2.45 3.15
Tapioca Flour, high grade, bgs .....lb.	.03½	.05½	.03½	.05½	.0215 .05
Tar Acid Oil, 15%, drs ..gal.	.21	.24	.21	.24	.21 .23½
25%, drs .....gal.	.24½	.27½	.24	.27½	.23 .26½
Tar, pine, delv, drs .....gal.	...	.26	.25	.26	.25 .26
tks, delv .....gal.	...	.20	...	.20	... .20
Tartar Emetic, tech .....lb.	.24¾	.25	.24¾	.25	.22¾ .25
USP, bbls .....lb.	.30	.30½	.28	.30½	.28 .28½
Terpineol, den grd, drs ...lb.	.13¾	.14¾	.13¾	.14¾	.13¾ .14¾
tks .....lb.	.13	.14	.13	.14	.13 .14

‡ Bags 15c lower; u + 10; * Bbls. are 20c higher.

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Methallyl Alcohol
Methallyl Chloride
Methyl Ethyl Ketone
Methyl Propyl Ketone
Tri Isobutylene

Manufactured by
SHELL CHEMICAL COMPANY
San Francisco

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Tetrachlorethane, 650 lb drs lb.	.08	.08½	.08	.08½	.08½	.09
Tetrachloroethylene, drs, tech .....lb.	.10	.10¼	...	...	...	...
Tetralene, 50 gal drs, wks lb.	.12	.13	.12	.13	.12	.13
Thiocarbanilid, 170 lb bbl..lb.	.20	.25	.20	.25	.20	.25
Tin, crystals, 500 lb bbls, wks lb.	.38½	.39	.35	.39½	.36	.39½
Metal, NY .....lb.	...	.51¾	.40½	.52½	.456	.52½
Oxide, 300 lb bbls, wks lb.	.55	.57	.47	.57	.51	.58
Tetrachloride, 100 lb drs, wks .....lb.	...	.26¾	.21¼	.26¾	.24¼	.26¼
Titanium Dioxide, 300 lb bbls lb.	.16	.19	.16¼	.19¼	.17¼	.19¼
Barium Pigment, bbls ..lb.	.05¾	.06	.05¾	.06½	.06¼	.06½
Calcium Pigment, bbls ..lb.	.05¾	.06	.05¾	.06½	.06¼	.06½
Toluol, 110 gal drs, wks gal.	...	.35	...	.35	...	.35
8000 gal tks, frt allowed gal.	...	.30	...	.30	...	.30
Toluidine, mixed, 900 lb drs, wks .....lb.	.27	.28	.27	.28	.27	.28
Toner Lithol, red, bbls ....lb.	.75	.80	.75	.80	.75	.80
Para, red, bbls .....lb.	...	.75	...	.75	...	.75
Toluidine, bgs .....lb.	...	1.35	...	1.35	...	1.35
Triacetin, 50 gal drs, wks lb.	.32	.36	.32	.36	.32	.36
Triamylamine, drs, wks ..lb.	...	1.25	...	1.25	...	1.25
Triamyl Borate, lcl, drs, wks lb.	...	.27	...	...	...	...
Trichlorethylene, 600 lb drs, frt allowed E. Rocky Mts lb.	.089	.094	.089	.094	.09½	.10
Triethanolamine, 50 gal drs wks .....lb.	.26	.30	.26	.30	.26	.38
tks, wks .....lb.	..	.25	...	.25	...	...
Tricresyl Phosphate, drs ..lb.	.22½	.26	.19	.26	.21	.23
Triphenyl Guanidine .....lb.	58	.60	.58	.60	.58	.60
Tripoli, airfloated, bgs, wks ton	27.50	30.00	27.50	30.00	27.50	30.00
Tungsten, Wolframite per unit	15.00	15.25	15.00	15.25	15.00	15.25
Turpentine (Spirits), c-l, NY dock, bbls .....gal.	...	.48½	.40½	.50	.43¾	.55½
Savannah, bbls .....gal.	...	.43½	.35½	.45	.38¾	.50¼
Jacksonville, bbls .....gal.	...	.43¼	.35¼	.44½	.38¾	.50¼
Wood Steam dist, bbls, c-l, NY .....gal.	...	.44	.38	.47	.43	.50
Urea, pure, 112 lb cases ..lb.	.14½	.15½	.14½	.17	.15½	.17
Fert grade, bgs, c.i.f. ..ton c.i.f. S.A. points ....ton	95.00	110.00	95.00	110.00	100.00	120.00
Urea, dom, f.o.b., wks....ton	95.00	110.00	95.00	110.00	..	..
Urea Ammonia liq 55% NH_3, tks .....unit		No prices		.96	..	.96
Valonia beard, 42%, tannin bgs .....ton	48.00	50.00	46.00	64.50	40.00	58.00
Cups, 32% tannin, bgs..ton	...	36.00	34.00	42.00	26.00	49.00
Mixture, bark, bgs .....ton	...	Nom.	...	Nom	...	32.00
Vanilin, ex eugenol, 25 lb tins, 2000 lb lots .....lb.	...	3.65	3.65	3.75	...	...
Ex-guaiacol .....lb.	...	3.55	3.55	3.65	...	...
Vermillion, English, kgs ..lb.	1.75	1.85	1.52	1.85	1.48	1.71
Vinyl Chloride, 16 lb cyl ..lb.	...	1.00	...	1.00	...	1.00
Wattle Bark, bgs .....ton	31.00	32.00	26.50	32.00	29.00	32.00
Extract, 60°, tks, bbls ..lb.	...	.03⅝	...	.03⅝	...	.03¼
WAXES						
Wax, Bayberry, bgs .....lb.	.16½	.17	.16½	.20	.17½	.23
Bees, bleached, white 500 lb slabs, cases .....lb.	.38	.40	.34	.40	.33½	.34
Yellow, African, bgs..lb.	.26	.26½	.24	.27	.21	.25½
Brazilian, bgs .....lb.	.28	.29½	.25	.29½	.21½	.26½
Chilean, bgs .....lb	.28	.29½	.25	.29½	.21½	.26½
Refined, 500 lb slabs, cases .....lb.	.29½	.32	.28	.32	.27½	.28
Candelilla, bgs .....lb.	.15	.16	.14	.17½	.10	.17½
Carnauba, No. 1, yellow, bgs .....lb.	.45	.47½	.43½	.48	.35	.54
No. 2, yellow, bgs ....lb.	.44	.45½	.42	.46	.34	.51
No. 2, N. C., bgs ....lb.	.37½	.38	.38	.40	.26½	.43½
No. 3, Chalky, bgs ...lb.	.33½	.35	.33½	.38	.21	.42½
No. 3, N. C., bgs ....lb.	.33½	.35½	.34	.41	.22½	.43
Ceresin, white, imp, bgs lb.	.43	.45	.43	.45	.43	.45
Yellow, bgs .....lb.	.36	.38	.36	.38	.36	.38
Domestic, bgs .....lb.	.08	.11	.08	.11	.08	.11
Japan, 224 lb cases .....lb.	.09¾	.10½	.08	.10½	.06	.09
Montan, crude, bgs ....lb.	.10¾	.11¼	.10¾	.11¼	.10½	.11¼
Paraffin, see Paraffin Wax.						
Spermaceti, blocks, cases lb.	.23	.24	.22	.24	.19	.24
Cakes, cases .....lb.	.24	.25	.23	.25	.20	.25
Whiting, prec 200 lb bgs, c-l, wks .....ton	...	15.00	...	15.00	12.00	15.00
Alba, bgs, c-l, wks ....ton	...	15.00	...	15.00	...	15.00
Gliders, bgs, c-l, wks ..ton	11.50	14.50	11.50	15.00	...	15.00
Wood Flour, c-l, bgs .....ton	18.00	30.00	18.00	30.00	18.00	30.00
Xylol, frt allowed, East 10° tks, wks .....gal.	...	.33	...	.33	.27	.33
Coml, tks, wks, frt allowed .....gal.	...	.30	...	.30	.26	.30
Xylidine, mixed crude, drs lb.	.36	.37	.36	.37	.36	.37
Zinc, Carbonate tech, bbls, NY .....lb.	.09	.10½	.09	.11	.09½	.11
Chloride fused, 600 lb drs, wks .....lb.	.04½	.05¾	.04½	.05¾	.04½	.05¾
Gran, 500 lb bbls, wks ..lb.	.05	.05¾	.05	.05¾	.05	.05¾
Soln 50%, tks, wks..100 lb.	...	2.00	...	2.00	...	2.00
Cyanade, 100 lb drs ....lb.	.36	.37	.36	.38	.36	.41
Zinc Dust, 500 lb bbls, c-l, delv .....lb.	...	.0755	.068	.0755	.057	.0685
Metal, high grade slabs, c-l, NY .....100 lb.	...	5.825	...	5.825	4.05	5.22½
E. St. Louis .....100 lb.	..	5.45	4.80	5.45	3.70	4.85
Oxide, Amer, bgs, wks..lb.	.05	.05½	.05	.05½	.05	.06¼
French, 300 lb bbls, wks lb.	.05½	.07	.05½	.07	.05½	.10⅞
Palmitate, bbls .....lb.	.22	.23	.22	.23	.21	.23
Perborate, 100 lb drs ...lb.	...	1.25	...	1.25	...	1.25
Peroxide, 100 lb drs ...lb.	...	1.25	...	1.25	...	1.25
Resinate, fused, dark, bbls lb.	.09	.10	.05¾	.10	.05¾	.06½
Stearate, 50 lb bbls ....lb.	.20	.23	.19	.23	.18	.22

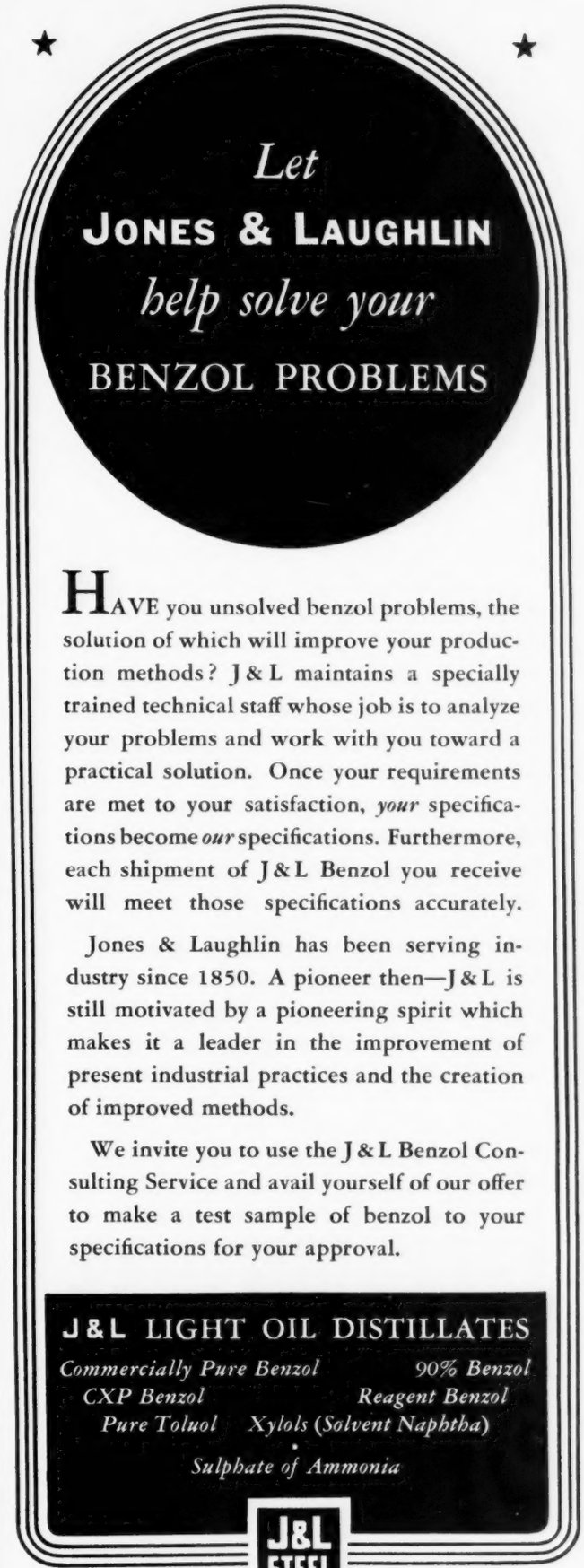
Current

Zinc Sulfate
Oil, Whale

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Zinc Sulfate, crys, 400 lb bbl, wks ..... lb.	.028	.033	.028	.033	.028	.033
Flake, bbls ..... lb.	.032	.035	.032	.035	.032	.035
Sulfide, 500 lb bbls, delv lb.	.09¼	.09¾	.09¼	.11¾	.10¾	.11¾
bgs, delv ..... lb.	.09	.09½	.09	.11½	.10½	.11½
Sulfocarbolate, 100 lb kgs ..... lb.	.24	.25	.24	.25	.24	.25
Zirconium Oxide, Nat kgs lb.	.02½	.03	.02½	.03	.02½	.03
Pure, kgs ..... lb.	.45	.50	.45	.50	.45	.50
Semi-refined, kgs ..... lb.	.08	.10	.08	.10	.08	.10

Oils and Fats

Castor, No. 3, 400 lb bbls.. lb.	.10¼	.10¾	.10¼	.10¾	.09¾	.10¾
Blown, 400 lb bbls ..... lb.	.12¼	.13	.12¼	.13	.11½	.16
China Wood, bbls spot NY lb.	...	.15	.13	.19¼	.094	.40
Tks, spot NY ..... lb.	...	nom.	.125	.19	.088	.35
Coast, tks ..... lb.	.137	.138	.127	.18	.087	.24
Coconut, edible, bbls NY.. lb.	...	.14¼	.09¼	.14¼	.04	.12
Manila, tks, NY ..... lb.	...	nom.	.04⅛	.07	.03¾	.06¼
Tks, Pacific Coast .... lb.	.08½	nom.	.03⅞	.08½	.03⅛	.06
Cod, Newfoundland, 50 gal bbls ..... gal.	...	.48¼	.40	.48½	.34	.38
Copra, bgs, NY ..... lb.	.0535	nom.	.0320	.0535	.02	.038
Corn, crude, tks, mills .... lb.	...	.10½	.08	.10½	.08¾	.11
Refd, 375 lb bbls, NY .. lb.	...	.12¾	.10¾	.13	.11½	.14
Cottonseed, see Oils and Fats News Section.						
Degras, American, 50 gal bbls. NY ..... lb.	.07¾	.08	.05¼	.08	.04½	.06
English, bbls, NY..... lb.	.07¾	.08	.04	.08	.04¼	.06½
Greases, Yellow ..... lb.	.08¼	.07¾	.03⅜	.08¼	.05	.06¾
White, choice bbls, NY lb.	.08½	.08¾	.04⅛	.08¾	.05¼	.08½
Herring, Coast, tks ..... gal.	...	.31	...	.31	.23	.33
Lard Oil, edible, prime ... lb.	...	.16¼	.12¾	.16¼	.09¾	.20½
Extra, bbls ..... lb.	...	.13	.09½	.13	.08½	.11¾
Extra, No. 1, bbls ..... lb.	...	.12¼	.07¾	.12¼	.08¼	.11
Linseed, Raw, less than 5 bbl lots ..... lb.	.115	.117	.104	.117	.091	.1130
bbls, c-l, spot ..... lb.	.101	.103	.096	.103	.083	.102
Tks ..... lb.	.095	.097	.086	.097	.0770	.096
Menhaden, tks, Baltimore gal.	...	.35	.25	.36	.25	.36
Refined, alkali, drs ..... lb.	...	.084	.066	.084	.061	.082
Tks ..... lb.	...	.078	.062	.078	.055	.072
Light pressed, drs ..... lb.	...	.078	.06	.078	.055	.076
Tks ..... lb.	...	.072	.056	.072	.049	.066
Kettle bodied, drs ..... lb.	...	.094	.08	.096	...	...
Neatsfoot, CT, 20° bbls, NY ..... lb.	...	.17	.16	.17	.16¼	.16¾
Extra, bbls, NY ..... lb.	...	.12½	.08	.12½	.08½	.11¼
Pure, bbls, NY ..... lb.	...	.11½	.11½	.12¾	.11¾	.13¼
Oiticica, bbls ..... lb.	.11	.11½	.10	.15½	.13½	.28
Oleo, No. 1, bbls, NY .... lb.	...	.14	.09¼	.14	.10¾	.14½
No. 2, bbls, NY ..... lb.	...	.13½	.08¾	.13½	.10	.13¾
Olive, denat, bbls, NY ... gal.	...	1.60	.73	1.60	.82	.95
Edible, bbls, NY ..... gal.	2.10	nom.	1.60	2.25	1.55	1.90
Foots, bbls, NY ..... lb.	...	.10⅜	.08	.10⅜	.07⅛	.10
Palm, Kernel, bulk ..... lb.	...	.083	.04¾	.083	...	...
Niger, cks ..... lb.	.06¼	.06½	.04	.06½	.034	.05¾
Sumatra, tks ..... lb.	...	.06½	.03¾	.06½	...	...
Peanut, crude, bbls, NY .. lb.	...	.10½	.08	.10½	...	...
Tks, f.o.b. mill ..... lb.	...	.10⅜	.17¾	.10⅜	.08¾	.10¼
Refined, bbls, NY ..... lb.	...	.13¼	.12	.13¼	.12½	.14
Perilla, drs, NY ..... lb.	.11½	.11¾	.07	.11¾	.07¼	.10¼
Tks, Coast ..... lb.	.11	.11¼	.066	.11¼	.068	.08½
Pine, see Pine Oil, Chemical Section.						
Rapeseed, blown, bbls, NY lb.	.13¼	.13½	.086	.13½	.07½	.09
Denatured, drs, NY ... gal.	.82	.85	.52	.85	.40	.56
Red, Distilled, bbls ..... lb.	.10⅝	.11⅝	.08⅝	.11⅝	.07¾	.10⅝
Tks ..... lb.	...	.09¾	.07¾	.09¾	.06½	.08¾
Salmon, Coast, 8000 gal tks ..... gal.	...	nom.	.31	.32½	.25	.35
Sardine, Pac Coast, tks .. gal.	.46	.47	.28	.47	.24½	.37½
Refined alkali, drs ..... lb.	...	.084	.066	.084	.065	.082
Tks ..... lb.	...	.078	.062	.078	.06	.072
Light pressed, drs ..... lb.	...	.078	.06	.078	.055	.076
Tks ..... lb.	...	.072	.056	.072	.049	.066
Sesame, yellow, dom ..... lb.	...	.13¼	.12¾	.14½	.12¼	.15½
White, dos ..... lb.	...	.13¼	.12¾	.14½	.12¾	.15½
Soy Bean, crude						
Dom, tks, f.o.b. mills ... lb.	...	.10½	.07	.10½	.08	.10
Crude, drs, NY ..... lb.	...	.11½	.076	.11½	.086	.11
Refd, bbls, NY ..... lb.	.12	.12½	.081	.12½	.091	.115
Tks ..... lb.	...	.11½	.07½	.11½	.08	.10½
Sperm, 38° CT, bleached, bbls NY ..... lb.	.10	.102	.094	.102	.099	.101
45° CT, bleached, bbls, NY ..... lb.	.093	.095	.087	.095	.092	.094
Stearic Acid, double pressed dist bgs ..... lb.	.11½	.12½	.08½	.12½	.10	.12¼
Double pressed saponified bgs ..... lb.	.11¾	.12¾	.09	.12¾	.09	.12¾
Triple pressed dist bgs.. lb.	.14½	.15½	.11¼	.15½	.12¾	.15¼
Stearine, Oleo, bbls ..... lb.	.12	.12¼	.07¼	.12¼	.09¼	.12½
Tallow City, extra loose .. lb.	...	.08⅜	.04⅛	.08⅜	.05⅜	.07⅜
Edible, tierces ..... lb.	...	.09½	.06¾	.09½	.07¼	.09¼
Acidless, tks, NY ..... lb.	...	.11¾	.07	.11¾	.07½	.10¾
Turkey Red, single, bbls .. lb.	.08	.08½	.08	.08½	.07½	.08½
Double, bbls ..... lb.	.12½	.13	.12½	.13½	.12½	.13½
Whale:						
Winter bleach, bbls, NY lb.	.085	.087	.072	.087	.07	.083
Refined, nat, bbls, NY .. lb.	.081	.083	.068	.083	.064	.081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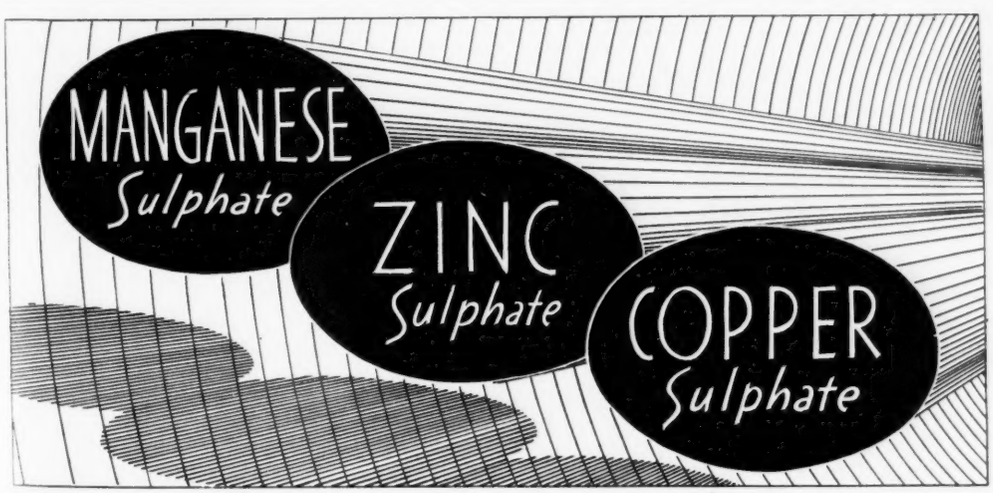

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Index to Advertisers

Abernethy, John F., Co., Brooklyn, N. Y. 111
Acticarbone Corp., New York City 110
American Agricultural Chemical Co., New York City 50
American-British Chemical Supplies, Inc., New York City 86
American Chemical Products Co., Rochester, N. Y. 104
American Cyanamid & Chemical Corp., New York City
Pages 6 and 7
American Oil & Supply Co., Newark, N. J. 108
American Potash & Chemical Corp., New York City 102
Atlantic Mutual Insurance Co., New York City 96

Baker Chemical Co., J. T., Phillipsburg, N. J. 100
Barium Reduction Corp, S. Charleston, W. Va. 101
Barrett Co., New York City 110
Beacon Co., Boston, Mass. 101
Bower, Henry, Chemical Mfg. Co., Philadelphia, Pa. 99
Buffalo Foundry & Machine Co., Buffalo, N. Y. 34

Calco Chemical Co., Inc., Bound Brook, N. J. 44
Carbide & Carbon Chemicals Corp., New York City 68
Chemical Sales Corp., Buffalo, N. Y. 108
Church & Dwight Co., New York City 86
Claflin, Alan A., Boston, Mass. 108
Columbia Alkali Corp., New York City 80
Commercial Solvents Corp., Terre Haute, Ind. 8
Corning Glass Works, Corning, New York .....Cover 3

Diamond Alkali Co., Pittsburgh, Pa. 61
Distributors Group, Inc., New York City 40
Doe & Ingalls, Inc., Boston, Mass. 108
Dow Chemical Co., Midland, Mich. .....Cover 1

Electro Bleaching Gas Co., New York City
Insert facing page 8

Fergusson, Alex C., Co., Philadelphia, Pa. 108
Franklin Research Co. (Wilbur White Division), Philadelphia, Pa. 103

General Ceramics Co., New York City...Insert facing page 33
General Chemical Co., New York City 13
General Dyestuff Corp., New York City 111
Giese, August, and Son, New York City 42
Grasselli Chemical Co., Cleveland, Ohio 56
Gray, William S., & Co., New York City 99
Greeff, R. W., & Co., New York City 106

Harshaw Chemical Co., Cleveland, Ohio 97
Heyden Chemical Corp., New York City 98
Hooker Electrochemical Co., New York City 38

Imperial Oil & Gas Products Co., Pittsburgh, Pa. 97
Industrial Chemical Sales Division West Virginia Pulp and Paper Co., New York City 1
Innis, Speiden & Co., Inc., New York City
Insert facing page 73

Jones & Laughlin Steel Corp., Pittsburgh, Pa. 107
Jungmann & Co., New York City 101

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Index to Advertisers

Kessler Chemical Corp., New York City 90
King, E. & F., & Co., Inc., Boston, Mass. 108

Mann, Geo., & Co., Inc., Providence, R. I. 108
Mathieson Alkali Works, Inc., New York City 3
Mechling Bros. Chemical Co., Camden, N. J. 102
Monsanto Chemical Co., St. Louis, Mo.
Insert facing page 80
Morgan, Clarence, Inc., Chicago, Ill. 108
Mutual Chemical Co. of America, Inc., New York City... 5

National Aniline & Chemical Co., Inc., New York City .. 78
National Can Co., New York City .....Insert facing page 81
National Carbon Company, Inc., Cleveland, Ohio 36
Natural Products Refining Co., Jersey City, N. J. 14
Neuberg, William, Inc., New York City 101
Niacet Chemicals Corp., Niagara Falls, N. Y. 90
Niagara Alkali Co., New York City....Insert facing page 9

Oldbury Electro-Chemical Co., Niagara Falls, N. Y. 104

Pacific Coast Borax Co., New York City 105
Pennsylvania Coal Products Co., Petrolia, Pa. 103
Pennsylvania Salt Mfg. Co., Philadelphia, Pa. 65
Petrometer Corp., Long Island City, N. Y. 42
Pfaltz & Bauer, New York City 106
Pfizer, Chas. & Co., Inc., New York City 76
Philadelphia Quartz Co., Philadelphia, Pa. 52
Polachek, Z. H., New York City 109
Prior Chemical Corp., New York City...Insert facing page 57

Rolls Chemical Co., Buffalo, N. Y. 108
Rosenthal, H. H., Co., Inc., New York City 105

Schwabacher, S., & Co., Inc., New York City 104
Sharples Solvents Corp., Philadelphia, Pa.
Insert facing page 45
Sobin, Irving M., Co., Inc., Boston, Mass. 108
Solvay Sales Corporation, New York City .....Cover 2
Starkie, A. E., Co., Chicago, Ill. 12
Starkweather, J. U., Co., Providence, R. I. 108
Stauffer Chemical Co., New York City 9

Tennessee Corp., Atlanta, Ga. 109
Texas Gulf Sulphur Co., New York City 105
Thornton Co., The F. C., Cleveland, Ohio 42
Trent Co., Harold E., Philadelphia, Pa. 42
Turner, Joseph, & Co., New York City 63

Union Carbide & Carbon Corp., New York City..Pages 36 and 68
U. S. Industrial Alcohol Co., New York City
Insert facing pages 64 and 65
U. S. Industrial Chemical Co., New York City
Insert facing pages 64 and 65
U. S. Phosphoric Products, Tampa, Fla. 108
U. S. Potash Co., New York City..... 103

Victor Chemical Works, Chicago, Ill. 54

Warner Chemical Co., New York City .....Pages 10 and 11
Wishnick-Tumpeer, Inc., New York City .....Cover 4

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"We"—Editorially Speaking

We see by the papers—

That—T.V.A. has made 50,000 tons of a new fertilizer almost powerful enough to grow crops on a watch crystal.—*Memphis* (Tenn.) *Press Scimitar*, Dec. 24, 1936.

❖❖❖❖

That there is not enough glycerine available to provide all the Prestone the dealers want.—*Business Week*, Nov. 28, 1936.

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That increasing prosperity is undoubtedly reflected in the difficulty which the manufacturers of anti-freeze face in keeping abreast of orders.—*Ind. & Eng. Chem.* (News Edition), Dec. 10, 1936.

❖❖❖❖

Well, we have talked about greater participation of chemists in practical politics for a long time. Now we have a chemical engineer, William S. Murray of Utica, as new Republican state chairman in New York. Let's hope he can blend political acids and alkalies and come up with a new product.

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Overheard at the technical table at the Chemists' Club:—"There is a lot of organic chemistry published that Rube Goldberg must have had a hand in writing."

❖❖❖❖

We record, at the earnest behest of our market reporter, the retirement of George P. Hitchcock of Nichols Copper. Here was a man it was a pleasure to interview. He never was too busy; never gave a wrong "steer" on the market; and he knew his blue vitriol from copper mine in Utah to Italian vineyard.

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We have been handing out some pretty liberal samples of the hobbies of the leaders of our chemical world, and now that the CHEMICAL WHO'S WHO is actually on the presses and will be bound and ready for delivery about February tenth, you might like to have some final scores of the hobbies. By a very big margin, golf leads all the rest with 1044, or in other words, roughly one in six of the chemical executives, the educators, the plant operators, and research technicians are devotees of the ancient Scottish game.

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Among the other notably popular sports and games are: tennis, 322; squash, 36; bowling, 53; swimming, 111; bridge, 128; chess, 41; skiing, 57; baseball, 46; hunting, 255; fishing, 659; camping, 86; sailing and yachting, 76; motoring, 89; horseback riding, 67; hiking, 85; mountain climbing, 59; travelling 150.

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The jackdaw habit seems pretty strongly ingrained and among the leading "collectors" we uncover: stamps, 393; books, 60; coins, 21; Indian relics, 14; antiques, 32; old glass, 11; firearms, 10; minerals, 46; fossils, 16; and a great long list of miscellanies from rings and rugs to shells and phonograph records.

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In the culture group of arts and letters there are plenty of devotees with catholic tastes: reading claims 238; history, 32; economics, 27; writing, 18; music, 113; singing, 11; theatre, 10; movies, 16; radio, 55; archaeology, 20; modern languages, 6.

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We have given some samples of the oddities among the hobbies—in the Preface of the work will be found the complete record, as well as that of all the 'steen hundred colleges and universities which have given degrees, and an index arranged both geographically and by companies; and, of course, the lives and accomplishments of 5096 chemical leaders, all for $6.

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Senator Reed Smoot attacks potash contract made with Germans.

John F. Queeny declares Germany most prosperous country in the world.

New use found for neon, as a spark detector or testing instrument for use by motorists.

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Dr. Lester Pratt appointed head of Merrimac's research department.

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Pacific Coast Borax plans refinery at Wilmington, Cal., to cost $1,000,000.

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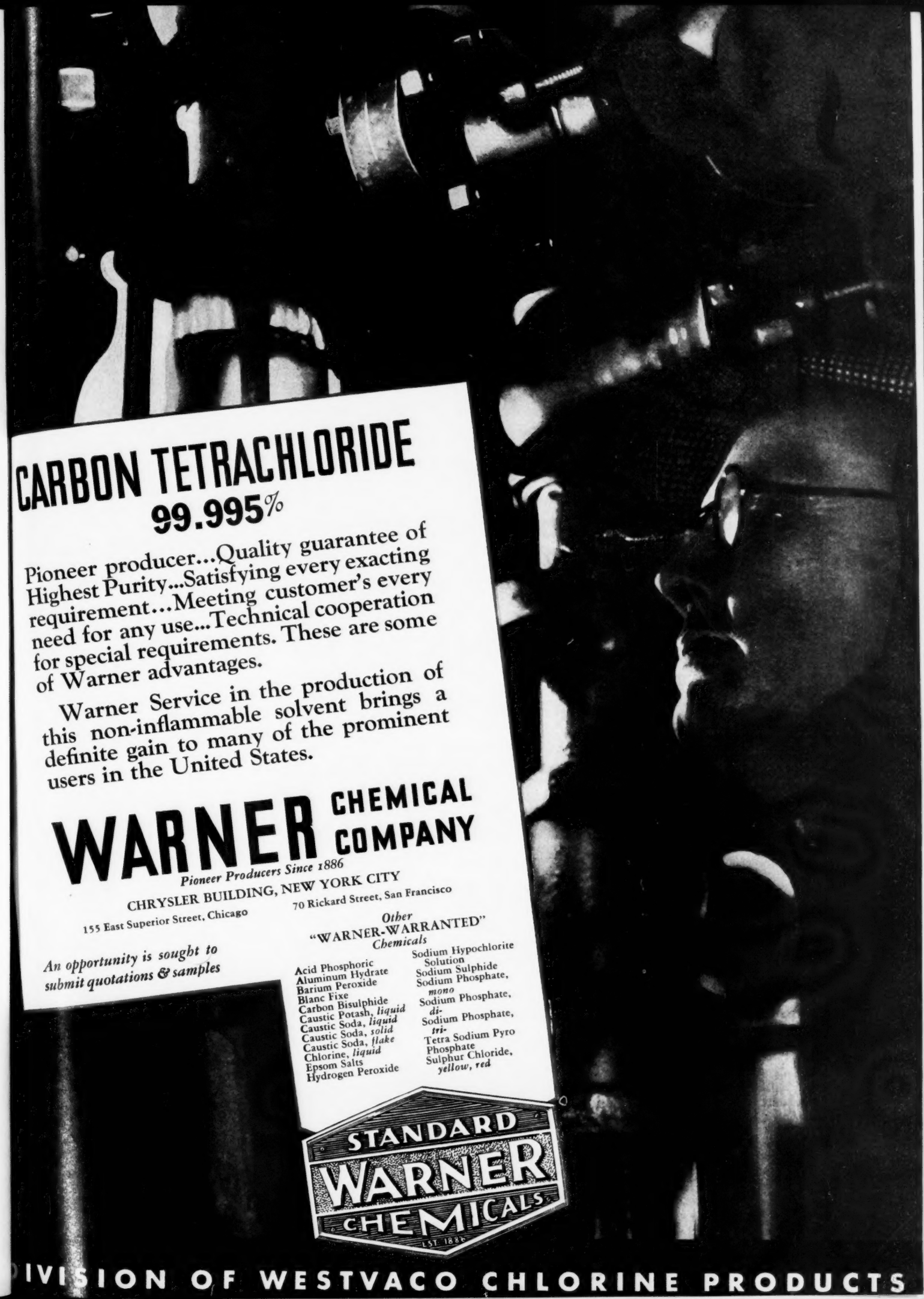

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